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VOYAGE
TO, AND
TRAVELS THROUGH
THE
FOUR PRINCIPAL ISLANDS
OF THE
A F R I C A N S E A S,
PERFORMED
BY ORDER OF THE FRENCH GOVERNMENT,
During the Years 1801 and 1802,
WITH
A NARRATIVE
OF
THE PASSAGE OF CAPTAIN BAUDIN
TO
PORT LOUIS IN THE MAURITIUS.

BY J. B. G. M. BORY DE ST. VINCENT,
OFFICER OF THE STAFF, AND CHIEF NATURALIST ON BOARD LE NATURALISTE SLOOP OF
WAR, IN THE EXPEDITION OF DISCOVERY COMMANDED BY CAPTAIN BAUDIN.

LONDON:
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YARD,
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1805.

ADVERTISEMENT

BY

THE TRANSLATOR.

THE title-page sufficiently explains the character, in which the author of the following *Travels* was employed by the French Government. The account he has given of his mission, is chiefly valuable as a collection of important facts. What he saw, he has described with perspicuity, and, without pronouncing any positive opinion himself, has left it to the learned to decide on the questions which his observations have suggested.

M. Bory de St. Vincent had frequently occasion to regret, that the collection of books with which he was supplied, was very small and imperfect. Having therefore to trust entirely to his memory, he was aware that some of the objects of Natural History, which he described in his *Journal* as new, might afterwards appear to have been discovered by others. It was also to be expected from the delay which took place in printing these volumes, that the author might be anticipated in the publication

of discoveries which he really had made. To these, however, he is willing to give up all claim, and has no objection to the names he has assigned to them being changed, with the exception of those of *Hubertia* and *Aubertia*, with respect to which, he begs the indulgence of the learned, as he is ambitious of paying the first tribute of gratitude to persons so truly respectable, and to whose labours the physical sciences are so much indebted.

ST. VINCENT'S VOYAGE.

CHAP. I.

VOYAGE FROM HAVRE TO TENERIFFE.

SEPTEMBER, 1801.

HAVING always entertained a decided taste for the perusal of voyages and travels, I had acquired a strong desire to pursue the same career as Tournefort, Lammanon, and Labillardiere. The expedition which was about to sail on a voyage of discovery appeared to afford a favourable opportunity for the gratification of my wishes. I therefore wrote to a relation at Paris who had always acted towards me as a parent, and who on this occasion procured for me the situation of first Zoologist on board one of the vessels destined to make a part of this expedition.

M. de Lacepede interested himself much in my favour; and so sensibly was I affected by the proofs of esteem conferred on me by this learned man, that I resolved to merit, if not by my knowledge, at least by my zeal, the confidence with which he deigned to honour me.

Towards the end of August, 1800, I left the Army of the West in which I served, and set out for Paris; where, having received from the Minister of the Marine and of the Colonies a letter which officially announced my appointment, and from the Minister of War leave of absence, I made the necessary preparations for my departure.

I left Paris the 30th September, 1800, and on the 2d October, at six in the morning, arrived at Havre-de-Grace; where our Commodore had arrived some days before. Here the different individuals belonging to the expedition met for the first time; and as circumstances did not permit us to sail before the 27th, we had time to become acquainted with each other.

I dare venture to affirm, since the Powers of Europe, anxious to extend the sphere of human knowledge, sent vessels to explore unknown regions, never was an expedition better calculated to facilitate the progress of science. Each traveller possessing talents, and animated by an enthusiastic zeal, carried along with him the sincere desire of acquiring information, and of rendering himself useful to the service.

We lost sight of the *Géographe* about two in the morning. She sailed much better than our vessel, whose way was less than that commonly made by other ships. At ten o'clock, when the day cleared up, we saw the commodore's corvette about three leagues on the south east of us. She had shortened sail, and lay to for us; and this she was always obliged to do in similar cases to enable us to come up with her.

In the afternoon the wreck of a mast passed us. This circumstance, which seemed to make little impression on others, excited some melancholy reflexions in my mind, which, however, soon passed away when the object disappeared.

The weather at length became beautiful, and we were sensible of a change of climate. About seven o'clock we saw four or five sail in company; and we learned from a brig that passed near us, that they were bound from Malaga to Hamburgh. In the evening we came close to the *Geographe*, and we got tidings of our companions for the first time since the 18th.

We flattered ourselves that we should soon see the celebrated peak of Teneriffe, though at noon we were still far from the Salvages, which are small desert islands between the Canaries and Madeira. The false relations of some navigators, and our anxious desire to land in a foreign country, had induced us to believe that we should distinguish the Canaries a great distance.

In the afternoon we saw a cutter, which at first we took for English, but which we afterwards learnt was a Spanish vessel. The cutter ran about four leagues on the starboard tack. At six she put about to approach the commodore, who lay to with the English flag of truce at the mast head. We passed on the stern of the *Géographe*, and received orders to continue our course. Shortly after we found it necessary to back our sails to the wind, and the cutter veered to avoid us. We then filled the sails again, and the little vessel fired a gun, which induced the commodore to throw his courses aback: but finding that there was no longer any danger of the cutter falling on board of him, we stood away together, and soon lost sight of this vessel which had caused so much embarrassment. The cutter, however, followed us all night. Bernier awaked me at three in the morning to ascertain, by observations, the distance of *Aldebaran* from the moon; and the sky was so serene, and the atmosphere so temperate, that I felt no inclination to return to bed. At day-light we descried the cutter again, which continued following us, and we did not lose sight of her until the afternoon. At two o'clock we came in sight of land, which lay S. S. W. on our larboard beam. It was the island of Canary. At four o'clock, we found that the eastern point of the

island bore by the compass south, and the western point south west.

Canary has the appearance of a single mountain, with a gradual elevation from its circumference to its apex. Teneriffe is still higher; and, when not covered by clouds, is remarkable for its Peak, which is one of the finest mountains in the world.

At three quarters past nine, the north point of the latter island bore west, and the south point S. W. $\frac{1}{4}$ W. by the compass.

The current, which is very strong here, had carried us towards the east, so that during the night we got within about six leagues of Canary. There is good sea-room all round the seven islands. No bottom is found by soundings till within two or three cables length of the coast. The anchorage is generally difficult on account of the rapid currents, and the volcanic rocks which compose the bottom, and which cut the cables under water.

About eight in the evening the *Géographe*, which was considerably a-head of us, shortened sail; and when we were within hail of her, the commodore asked whether Mr. Hamelin was not of opinion that the land first seen to the S. W. was Canary. We then received orders to put about on the other tack at nine o'clock, and not to think of nearing the land until day light. We therefore stood off and on during the night on different tacks, and waited impatiently for the morning.

It was surprizing that we had not sooner seen the Canaries; and it was, doubtless, the cloudy state of the horizon that concealed them. When we descried them, they already appeared elevated; and the Peak, which seemed separated from the northern part of Teneriffe, presented a most magnificent spectacle.

I got upon deck at day light to enjoy the sight of land, the contours of which became every moment more apparent. The Peak disappeared, and was covered by the vapours which form its usual diadem.

We approached Teneriffe on the point *Nago*, in the position in which it is laid down in M. de Borda's chart of the Canaries. Though his view is engraved with great care, it is very small, and exhibits too few details. I endeavoured to obtain a more perfect representation by a drawing which I took at eight in the morning, at the distance of about four leagues from the coast.

Nago is one of the most northerly points of Teneriffe. It is recognized by the small detached rocks called the rocks of *Nago* or *Anaga*. Its longitude is $18^{\circ} 26'$ and its latitude about $28^{\circ} \frac{1}{2}$.

At eleven a pilot came on board to carry us into the road,
[T. VINCENT.]

where we dropped the last bower-anchor, in twenty-six fathoms water, the bottom being blackish volcanic sand.

In this first part of my voyage, which was completed in a fortnight, I made no observations in natural history, excepting that during the whole passage we did not see a single fish. Commodore Byron, in his Voyage round the World, remarked also that he saw no fish in the same passage, which he attributed to his ship being copper-bottomed. This opinion is very much credited by seamen; but as we met with fish between Teneriffe and the Isle of France, I doubt very much whether it was the copper that made them avoid us in the passage between Havre and the Canaries.

The fresh bread which we brought from Havre lasted us until we reached Teneriffe. The Captain had also laid in a quantity of milk, which was warmed every morning, and kept well until the very day of our arrival. I shall say nothing here of the wild, barren, and arid appearance of the part of Teneriffe, where we lay, as I shall have occasion to notice that in the next chapter.

CHAP. II.

TENERIFFE.

OCTOBER, 1800.

AFTER we cast anchor, Captain Hamelin went on board the *Géographe* to receive orders, and soon sent back his boat to inform us that we might also come on board the Commodore and visit our friends.

About one o'clock I landed, with Herisson, Peron, and Bissy. Soon after I separated from some persons belonging to the expedition, who had joined us, and in company with Peron and Bernier took possession of the first exotic plant we had ever seen in its native soil. We wandered over one of those declivities, the aspect of which appeared so barren from the ship. The sun had burnt up the vegetation, and nothing remained on the ground but dry culms. Here and there some *Euphorbia* and *Cacalia* variegated the lava of which the soil is composed.

I brought back several plants in my handkerchief. The principal were a kind of *Viscous Golden Rod**, which had a penetrating odour, and preserved its viscosity long after dessiccation; and the *Shrubby Baum*†, which grows upon the rocks and volcanic stones, near the shore. A very pretty species of thyme grows among the clinks of the stony soil. It has small rose-coloured flowers, and elegant leaves, similar to those of myrtle in minia-

* *Erigeron Viscosum*. L. † *Melissa fruticosa*. L.

ture: But that which pleased me most was a gramineous plant, of the greatest beauty. It bears little panicles, with white flowers. The glumes are villous, or rather downy; the anthers are rose-coloured. This charming plant has been described under the name of the *Sugar of Teneriffe**. It is peculiar to the Canaries, and appears to be improperly placed in a genus, the arrangement of which is in other respects faulty.

We returned to the town with a keen appetite for dinner. None of us understood Spanish, and we went into a guard-house to see whether we could not find a soldier who understood French, to shew us an inn. We found several capable of conversing with us, and one of them very civilly offered his services. He conducted us to a large inn, or *fante*, which had the Imperial Eagle for a sign. This house, like all the rest in the town, had only one story. The apartments, which were large and spacious, had no ceiling, and were almost without furniture. The walls were merely white-washed, and the frames of the windows were of an enormous thickness. We had a very indifferent dinner for a *gourde*, which is equal to about five francs. There was a great deal of Cayenne pepper in all the dishes, agreeably to the prevailing taste for high-seasoned food in hot climates. We were served at the dessert with a sort of grape, which was new to me. It is that which is used in making the small wine of the Canaries, called in the islands *Vidogue*. The berries are heavy, and contain fifteen or twenty seeds, which are black, hard, brittle, and slightly saccharine. They are as large, and of the same form as olives. Their skin is very thick. It appears that a great number of the flowers are blighted, for the grapes I saw had many barren foot-stalks.

Our landlord was a jolly Italian, from Milan, who had settled at Teneriffe on his return from a voyage to China. Peron and Bernier, who could converse pretty well in his language, made him talk a great deal, and asked a number of questions respecting his female neighbours, whose handsome persons had struck us, notwithstanding the bad taste which had prevailed at their toilettes. These ladies kept close to their window-blinds from the time we entered, at three in the afternoon, until seven o'clock, when we left it. Probably they had taken their peeping station before we saw them, and stuck to it after we were gone. It must be confessed, that if our Parisian ladies mis-spend their time, they do not throw it away in a manner so dull, both for themselves and others, as the fair Spaniards of the Canaries.

In the evening the garrison defiled on the parade, after the roll-call. It consisted at this time of three regiments; that of

* *Saccharum Teneriffæ.*

America, that of Ultonia, which is Irish, and that of the Canaries. There were French and Flemings in these corps, which were kept up in very good condition.

Before the Spaniards knew and possessed the Canaries, these islands were inhabited by the *Guanches*, who may rank among the most respectable people of the Universe, and are highly worthy of the attention of philosophers. Simple and just, their laws were not numerous, but were respected by all, and strictly executed. Teneriffe, which had long been a single state, had nine kings, all relations, at the time of its conquest. Those kings were dressed like their subjects; and their only mark of distinction was a crown of laurel. Their sceptre was the thigh bone of one of their ancestors. This relic of a respected prince constantly reminded them that they ought to endeavour to merit like him the love and the regret of their people.

The Guanches had a form of worship, and a high priest, who presided at their religious ceremonies; and yet it is believed, on pretty good grounds, that their ideas of religion were very few. The origin of the mysterious customs, they practiced, was unknown to them, and they appeared to have derived them from some more enlightened nation, of which they had lost all recollection. One of their customs was a sort of baptism, which induced Father Feville, and after him another Spaniard, to suppose that St. Avite, or even St. Bartholemew the apostle, had preached the Christian religion in the Canaries, and that its principles being forgotten, only some degenerated rites were preserved: Be this as it may, all the answer given by the Guanches, when interrogated respecting their form of baptism, was, that they inherited it from their ancestors, and that it was a very salutary custom.

This practice, joined to the circumstance of a wooden figure of the Virgin, which the natives had picked up on the shore, being found at Guimar, was sufficient to make the Spaniards believe that the mother of Christ had revealed the mysteries of the Christian religion to the inhabitants of the Canaries, to prepare them for the Evangelical Communion, which was to be preached to them a century after they got possession of the wooden image. But whether, notwithstanding all the favours of the Virgin, the Spaniards still regarded them as heretics, or whether these orthodox robbers took a liking to the country, I shall not pretend to determine; the legitimate and peaceable proprietors of Teneriffe were, however, exterminated; blood covered the soil which had nourished them, and which they endeavoured to defend with a heroic courage. As a memorial of this shocking act of barbarity, an obelisk of white marble is erected on the parade. This monument is surmounted with a

Virgin Mary, holding an infant Jesus in her arms. On the four angles of the base are four Kings of the Guanches, each with his laurel crown and femoral sceptre. These kings are in the attitude of prayer or inspiration. Each face of the monument is covered with analogous Spanish inscriptions.

It was stated to M. Pingré, M. de Borda, and also to myself, and several travellers have related, that there still exist on the coast of Guimar some descendants of the unfortunate Canarians; and these, in consequence of a slow return to justice, they are now respected. It is even asserted that they form a part of the procession which takes place at Candelmas, when they appear in the Guanche dress in honour *de la aparición de la nuestra Señora de Candellaria 104 años antes de la predicacion del Euangelio*, which happened in 1497. All this, however, appears somewhat apocryphal, and those who are best informed, believe that these pretended descendants of the Guanches are impostors.

Historical details respecting the ancient Canarians would here be out of place: But their manners, their customs, and their arts have already attracted my particular attention. I have endeavoured to investigate their origin, and on that subject the reader may consult my *Essais sur les Iles Fortunées*.*

The Guanches embalmed their dead, and catacombs excavated by that people are daily discovered in the island. Every person belonging to the expedition obtained some fragments of mummies. M. Broussonet had the kindness to give me a whole one, and M. Cologan, enriched me with some numerical signs, formed of baked earth which were employed at Tenerife to express quantities. I have described them in my essays. It appears that the Guanches were not acquainted either with metals or money.

The mummies of the Guanches are very imperfect as may be supposed. It appears that they did not completely embowel them. All the intestines frequently remained in the body and in many mummies there is no appearance of any thing having been drawn from the cavities of the thorax, the abdomen, or the cranium. Their dryness and tan-like colour gives them the appearance of corpses which have remained unconsumed in burying grounds, of which there are instances in some cemeteries of our provinces. They possess however an agreeable aromatic odour of which time has not been able to deprive them. They are frequently full of desiccated larvæ and chrysalides which had lived subsequent to the preparation but without doing much injury to the mummy along with which they are very well preserved. These mum-

mies were called *Xaro*, after preparation they were enclosed in sewed skins, which are also well preserved and deposited in grottoes, which were respected as the last retreat of the Canarians of all classes.

To give an idea of the principal town of the Canaries, I shall transcribe some passages from my Essays:

"Teneriffe contains more than 200 towns, villages, and hamlets. The most important is *Santa Cruz*, which is the residence of the Governor General of the Seven Islands, the Consuls and Commissaries of foreign nations, &c. The population is about 8397. It is the centre of the commerce of the Canaries with foreign countries, and the port most frequented by vessels from Europe.

"The harbour is the only advantage which the town has with respect to situation. There is no other circumstance to induce men to reside there. The road is large enough to contain ten or twelve ships of the line; but a greater number would not find room or would be obliged to cast anchor in a bad bottom. The water is very deep; there are from thirty to forty fathoms within two cables length of the shore; farther out the depth is sixty or seventy fathoms and soon after no bottom is found with a line of 80 fathoms. It is reckoned a safe roadstead.

"A mole solidly built with very hard black volcanic stones advances a little into the bay towards the east. It is rounded at its extremity, on which four eighteen pounders are mounted. The landing-place which is on the inside is very inconvenient. Great precautions are necessary both in embarking and disembarking, but the danger would be much less were the Mole prolonged. The Custom-House is at the top of the stair, which lead from the landing-place. A wretched wooden gate forms the entrance to the town.

"*Santa Cruz* is built in a very different style from our French towns, but is not less agreeable. The streets are generally strait, pretty broad, and well-aired. Most of them have of late been paved, particularly in front of the houses, where footways are formed of little egg-shaped stones surrounded by larger square stones. This pavement is raised four or five inches above the level of the street, the middle of which is frequently unpaved, but full of fragments of rock and dust.

"The houses are neatly built with plaster or stone fronts. Great care is taken to whiten them and even to paint them, which gives a clean appearance to the town. The houses are divided into apartments of a considerable size. We enter at first into a large space between the street door and the yard door, in which there is always a very disagreeable smell, for as it is thought indecent to urinate in the streets, persons who are pressed

by that necessity enter this space without ceremony, where they find a little stone trough perfectly suited to their purpose.

"There are three principal squares in Santa Cruz:—that which is situated at the entrance of the town, by the Mole gates, and in the middle of which there is a fountain in the form of a cup, built of black lava. The water is clear, pure, and abundant. In some summers, however, it is only opened at certain hours to prevent its being exhausted."

(The obelisk mentioned before is situated near this well.)

The road is defended by several forts built on the sea side, two or three of which are within the town. They are in general well situated. The northern forts stand at the foot of the mountains of the coast, at the entrance of the valleys.

We met in the squares and streets of Saint-Croix many priests and monks in the dress of their different orders; which was to us a new spectacle. The streets of this city are likewise crowded with beggars, especially females, with half-naked children, who exhibit a most wretched appearance, and who load the passenger with every kind of abuse in Spanish, if he be unwilling or unable to relieve their wants. This circumstance joined to the little activity which prevailed in the port, (salt fish being the only commodity that was at that time brought into it,) gave me a very unfavourable idea of this island; which nevertheless enjoys a certain degree of convenience, and might be rendered extremely flourishing.

The merchants and all those connected with some branch of commerce form the only respectable part of the inhabitants of this city. Gentlemen and people living on independant fortunes reside at Laguna. In general the inhabitants situated near the port, have adopted several of the English customs; the men however, mostly follow those of the French.

Unfortunately the Spanish women display not the good sense of their husbands, and are yet far from evincing that taste which French women indisputably possess beyond all others. The mode of dress employed by the females of the Canary islands is very inelegant and absurd; they all wear, besides many petticoats, a kind of cloak or mantle tied round the waist, which can be thrown back so as to leave an opening only above; its borders are fastened over the head, whilst the rest of it covers the neck, back, and shoulders; this awkward dress also confines the arms, and is so disposed as to leave only a small opening for the face. The females of the lowest order wear this mantle made of a very coarse grey woollen stuff, and over all a large round hat. I saw some peasants with mantles of a yellow-colour, and ornamented with a blackish border, which did not produce quite so bad an effect; and as they al-

lowed them to remain open, it rendered them much less inconvenient.

The more opulent females, and devotees of high rank appeared for the most part wholly in black. Their mantles were of a very fine crape, or rather of serge; they wore no hat. I frequently saw them walking slowly, and in silence, along the streets in their way to the churches, either alone or in company with one or two others without any male attendant; they paid not the least attention to any passing object; several of them even kept their mantle shut by their hands, leaving only an opening sufficient to enable them to distinguish their way.

I have however, observed some of these female islanders who had partly adopted the French fashions; they either wore no mantle, or had it made of fine thin muslin, which is certainly better calculated than woollen stuffs for a warm climate.

None of the females whom I beheld in this island had any pretensions to be termed beautiful; although several of them had fine teeth and large eyes; they are in general meagre, very brown, sharp nosed, and have altogether the air of the Portuguese.

In this superstitious country, the streets, the squares, and the mole are crowded every evening with common prostitutes, who, muffled up in their inelegant mantles, endeavour by every effort in their power to attract the notice of passengers. Labillardiere affirms, that they never omit during their charitable occupations to carry a chaplet in their hands. Captains of ships, who attend to the health of their ship's crew, cannot during their stay at Teneriffe take too many precautions to prevent all intercourse between their men and these females. The venereal disease and the itch are very prevalent maladies; I have even been assured, that there is scarcely a single female of this class whose constitution is uncontaminated by the former of these diseases. The elephantiasis, according to report, sometimes occurs in the island; a species of the itch termed by the natives *sarna*, is also endemic among them, but which, through an absurd prejudice, they never attempt to cure.

On the 12th, at day break, I went ashore in company with Bailly and Deslisses in order to join Michaux, who had slept at the house of M. Broussonet, the commercial commissary of the French Government.

We traversed the heights situated behind the city towards the north-west, and made a frugal breakfast by the side of an aqueduct, by means of which the inhabitants of Saint Croix are supplied with water. This canal follows the bendings of the mountains which are sterile and wholly destitute of verdure.

It is difficult to convey an adequate idea of the nature of the soil to those who have not seen something similar. It is merely

composed of volcanic productions, and is altogether destitute of vegetation, excepting that here and there we observe, between the interstices of the stones, tufts of the fig-tree, of the *Cactus*, *Cacalia* and *Euphorbia*, whose succulent, and healthy appearance forms a striking contrast with the aridity of the soil.

The *Cactus* is a very succulent plant, commonly known under the name of the Indian fig-tree, and of which several species are cultivated in the different orangeries throughout the island: they are only valued on account of the beauty of their appearance, as they all bear a very bad mucilaginous fruit. That species of *Cactus** is also found in Teneriffe, on the leaves of which in South America, the cochineal insect feeds. But as the animal itself has not yet been brought into the Canary islands, the cochineal still continues to form an exclusive article of commerce to the Spanish colonies in Mexico.†

The *Cacalia* forms a genus of plants with compound flowers, but their characters derived from the fructification are very similar, however much they differ from each other in external appearance. The species peculiar to the Canary islands, is that which botanists term the *cacalia* of Klein‡; and is cultivated in our green-houses. Its large fleshy branches, and its succulent and obtuse leaves, give to it an appearance resembling some species of *euphorbia*. This resemblance probably induced Mr. Anderson, an English botanist, to refer it to that genus, and to affirm that there are two species of *euphorbia*, one of which possesses a very acrid taste, and the other (the *cacalia* of Klein) has an aromatic flavour. He adds that its succulent branches are employed in the same manner as leguminous vegetables. This error is too obvious to mislead any one in the least conversant with Natural History.

The most common species of *Euphorbia* at Teneriffe is that which Linnæus has named *Canariensis*. It grows on the rocks and the barren shores, and every part of it yields a liquor of the colour and consistence of milk, but of a disagreeable acrid taste. The plant is only used for burning after it is dried. It is then exceedingly light and the internal part which is cellular resembles, as to substance, dried elder.

The stalks of the *Euphorbia Canariensis* rise to the height of four feet and a half. They form an angle at their base, but are straight in the rest of their growth: they are thick and qua-

* *Cactus cochenillifera*. L.

† The Spaniards endeavour to confine both the insect and the plant on which it feeds to Mexico. But this attempt at monopoly will, we trust, be frustrated by the exertions of some gentlemen in the East Indies. T.

‡ *Cacalia Kleinia*.

drangular, and sometimes quintangular. The surfaces, which are from one to two inches broad, are plain, smooth, and of a beautiful green colour. The edges which are obtuse and of a brown colour, are furnished with thorns in pairs; they support the fructification which is not very similar to other plants of the same genus.

Having returned on board I made up my packets for France; as M. Broussonet had obligingly informed us that a cartel with English prisoners would sail in three days at farthest for Gibraltar. I got up before day-break and went with Michaux, Deslisses and Bailly on board the *Géographe* to meet Riedlay: But having unfortunately sent back our boat, we lost a part of the morning before we had an opportunity of going ashore.

After passing along a narrow beach composed of detached pebbles and very difficult to walk over, I entered with an officer who accompanied me into the third or fourth valley on the north-east side of the town. This valley was very rich in plants and much less gloomy than the others, for a streamlet flowed along the bottom and gave animation to the scene. Two or three white houses shaded by orange trees, bananas, and agaves in flower, bounded and formed an agreeable contrast to the monotonous sterility of the rocks we had passed over.

In passing along the beach I examined the ridges of rocks which are washed by the waves, and alternately covered and uncovered by the tide. They are volcanic and afford only five or six *fuci*; but to make amends, I met with several fine *confervee*, among which were some new ones to add to the great number I have discovered in our temperate climates. I also observed in this place an *ulva*, which I regard as a non-descript. [See *Essais sur les Iles Fortunées*, chap. v. Botanique, no. 13.]

Our frugal dinner was to me an exquisite repast. We sat under the shade of a hillock covered by some tufts of *Euphorbia* and *Crassula* of different species. We sent a little cabin-boy belonging to M. Frescmet, jun. whom that officer had obligingly ordered on shore to carry my botanical box. This youth whose name was Cadet, was very intelligent, strongly attached to his master and uncommonly docile. He tried to make himself understood as well as possible to some of the islanders from whom he was purchasing oranges. They could not give him change for some small money he gave them, and therefore desired him to take as much fruit as he chose. He gathered them from the trees, and returned to us with a bottle of water and about fifty oranges, of which we ate as many as we could, and the remainder was an acceptable present to Riedlay and Deslisses, whom we met exhausted with fatigue, in the course of our herborization.

A little boy, black as an African, followed Cadet, to carry back the bottle. An old cap covered his head, besides which he had no other cloathing except a dirty shirt. He ran barefoot over the sharp lava, which hurt us notwithstanding our shoes. He did not attempt to speak to us, nor to answer our questions which we endeavoured to suit to his years. He sat quietly down beside us on a stone, and paid very little attention to a piece of biscuit we offered him. He took it however, but without any expression of thanks.

Our bottle of water being emptied, we wished to make him understand that we wanted him to fill it again; but all the signs we employed were unavailable. He looked at us as if he understood what we meant, and when we gave him the bottle he lifted it to his lips to drink. He repeated this thrice, though we told him, both the first and second time in Spanish, that he was not doing what we wanted. At last he took the bottle in one hand and the biscuit in the other and ran off as if he meant to satisfy us, but did not return.

The bottle was brought in a basket, which we carried back to the house, where we stopped to examine the stalk of an *agave**

The leaves of this plant are cut and spun into a kind of coarse thread of which ropes are made; but judging of the specimens I saw on board the small vessels in the road, I formed no favourable opinion either of their strength or flexibility.

The inhabitants of this valley had planted not far from their garden a field of the *Convolvulus batatas*, Linnæi, to which the name *patate* is given. This plant is sarmentous and covers the ground with its creeping stalks. It has saccharine roots of a very delicious taste, and must not be confounded with what we improperly call potatoes in Europe, which are the roots of a species of *Solanum*. The islanders told us that several persons dressed like us had already passed that way; which induced us to penetrate farther into the ravine in quest of them. We made a successful herborization, the principal acquisitions were a beautiful *sow-thistle* without flowers, but with very elegant leaves which proceed from the lower part of the stem and form a very fine roset, an *Echium giganteum*, L. a *Verbena nodiflora*, L. a *Cyperus lateralis*, L. &c. and besides these plants which belong to warm countries, I found several which are also met with in our climates. We soon found Riedlay, Deslisses and the gardeners who accompanied them. Flora had not been so kind to them as to us. They admired a *Justitia* which appeared to me to be as yet imperfectly known, and which I had collected. I conducted them to the place where the plant grew on a steep

* *Agave Americana*. L.

rock of very difficult access. In return Riedlay led me to another valley, where we found a beautiful species of fern which I have already described under the name of *Asplenium latifolium*. [See my Essays, page 311, No. 92.] I also found in the same place the *Prenanthes pinnata*, L. and the *Adiantum reniforme*, L. which I have since seen several times on the mountains of the Isles of France and Bourbon. The leaves of this beautiful fern are thick, entire, and of the shape of a kidney. It grows also in Madeira and America.

On our way back to the town we saw Dr. Laridon, with the Mineralogists Depuch and Bailly, on a rapid declivity to our left. From excess of zeal they had so over loaded themselves with geological riches, that they bent under the weight of their burthen and were soon obliged to abandon a part of it. Besides the plants I had collected, I also carried, though not without considerable trouble, some beautiful specimens of basaltic lava in plates, which divides into laminae like slate and forms entire mountains. I had also picked up some basaltic prisms of the greatest regularity. I found them rolled into the ravines. Most of them had four or five faces and were from three to eight inches long. For a more ample description of the mineralogical productions found in the valleys of Teneriffe, the reader may consult the 5th chapter of my Essays on the Fortunate Islands, Nos. 1, 2, 3, 4, p. 266.

Throughout all the coast that we traversed, as well as in the immediate vicinity of Saint-Croix, besides many maritime plants peculiar to the country, or common to it with others, we observed a shrub of a very singular appearance growing in great profusion: this shrub which is known in the island by the name of *ballot*, and considered as a very violent poison, I did not see in flower; but its stem is branchy, and rises to the height of five or six feet; its leaves are pendulous and linear, fleshy, and of a very deep green, and like those of the *chenopodium* or wild orach, exhale a disagreeable odour. The fruit which it bears, hangs in clusters on loose panicles at the extremity of the branches; it is roundish, white, somewhat transparent, and contains one or two seeds. I assisted Riedlay in collecting a great quantity of these seeds.

I was busily occupied all the morning of the fourteenth, in arranging and preparing my collections of the former evening; for two inhabitants of the island M. Cologan the son, and M. Murphy the younger, had engaged to dine and spend the day with us; the former of these gentlemen, who usually resided at Orotava, spoke the French language with great fluency. He was the nephew of the worthy M. Calogan, who gave so kind a reception to the philosophers Pingré, de Borda, and Labillard-

diere, during their stay at Teneriffe. These gentlemen expressed themselves with much enthusiasm on the subject of the French Revolution, of which they were zealous partisans. If we may rely on the information we received, that all the respectable inhabitants of Spain think nearly alike with those of the Canaries, it is much to be wished for the happiness of that kingdom, that the first magistrate of the state may possess wisdom to correct the abuses that exist, without waiting for a fatal revolution which might then overturn the present order of things.

We accompanied our guests ashore, and I paid a visit to M. Broussonet, the commercial agent of the French Government; the name of this illustrious naturalist is sufficiently known: M. Broussonet, who formerly belonged to the academy of sciences, but is now a member of the national institute, joins to his great knowledge, an affability and politeness, which renders him truly amiable. I expected to have brought with me letters of introduction to M. Broussonet from our common friend Bosc, but was disappointed, as I did not see him during the short time I remained in Paris, previous to my departure; I found in this gentleman's house several Frenchmen, who set off on the following morning for Bourdeaux.

It had been my intention to proceed to Laguna, on the 15th, in order to visit one of the sepulchral caverns of the Guanches; but I was induced to postpone that intention from an anxiety to arrange my collections; and to see M. Cologan before his departure for Cadiz, that I might entrust to him some letters for France; I was however disappointed, for the ship in which he had taken his passage sailed at a very early hour.

I afterwards went ashore to pay a visit to M. Bernier in the observatory which he had erected in the house of M. Cartas, the governor. Thence I proceeded to the residence of M. Broussonet, where I found M. Baudin, who had obtained permission to select some insects from the cabinet of the commissary. Among the great number of rare species contained in this collection, I observed several which are found at Sierra-Leona and on the coast of Guinea. I myself possessed the greatest part of these species in a collection that I formerly purchased. Latreille, who examined them with me, considered many of them as new, or at least as very uncommon. None of them, however, appeared equal, in the opinion of M. Baudin, to a small white butterfly, which he continually contemplated with all the enthusiasm of a connoisseur. "It is the butterfly of the Orange!" exclaimed he. It was the *Argia* of Fabricius.

In the evening I met Michaux at the house of the commissary, who accompanied us to the port; and entered into a long conversation with us on the plants of the island. Teneriffe,

according to the opinion of M. Broussonet, contains a great many plants which are peculiar to it; he proposes to publish an account of them in fasciculi, under the title of *Rare Plants of the Canary islands*; but he does not appear disposed to publish a *Flora Canariensis*, which however, would be a work worthy of him.

Among the various plants which M. Broussonet has described, and which he had the goodness to shew me, were several *Statices*, one of which I found to be arborescent, and to bear large corymbs with violet-coloured flowers. I also remarked the following :

A very singular tetrandrous plant which had altogether the appearance of a solanum, but which did not belong to that genus; one of its stamens was much larger than the rest, as if it had derived a super-abundant increment at the expence of the others; its corols, which were unequal, monopetalous, and of a violet colour, resembled those of the *morel of Sodom*, (*Solanum Sodomæum*).

A beautiful *Ranunculus*, resembling that termed *Creticus*. A *pancratium*, which was then in flower, on the opposite side of the island that we had not visited.

A *Prenanthes*, which at first sight might be mistaken for the prickly lettuce, but which, besides its generic characters, differs in having yellow flowers, whilst those of the lettuce are blue.

Many other beautiful compound plants, several important grasses, some early *orchides*; few or none of the *umbellatæ*, several rare ferns, and many others of the class Cryptogamia.

Skybroom (*Spartium supranubium*) which in fact grows on the Peak of Teneriffe above the region of the clouds, is likewise a plant peculiar to the Archipelago.

I also noticed many new and beautiful species of *Euphorbia*; one of which bears only a single flower on the extremity of the thick-leaved branches; another of them is crowned by umbels, which are throughout of the most exquisite carmine colour.

The contemplation of these botanical riches inspired me with the desire of examining the country which produced them; and it was resolved that we should herborize on the following day at Laguna.

On the 16th, at day-break, I set out with Deslisses to put our project into execution: We found the road much shorter than we had supposed it to be from the description of former travellers, who affirm that three hours are necessary to reach Laguna, whereas we accomplished it in not more than half that time. Our progress was, however, frequently retarded by rocks and ravines, which render the roads throughout the island, very disagreeable.

On leaving Saint-Croix, we came to a baranco, for so the inhabitants term the ravines which remain nearly dry the whole year, but which during the rainy season become real torrents; this baranco is crossed by a pitiful bridge, near which they have nevertheless erected a white marble stone with a pompous inscription.

In the vicinity of this place we observed an Indian mallow, (*Sida*) and a fine specimen of bind-weed, (*Convolvulus*).

We found the road very bad, and bounded by sand and walls of dry stones, intended to mark the limits of the grounds belonging to different proprietors, and not, as Mr. Anderson supposed them to be, in his Account of Cook's third Voyage, mere masses of rock removed from the fields in order to render them fit for cultivation.

When about half-way, we lost sight of Saint-Croix, and its sterile soil; nature here assumes a more smiling aspect, the mountains become more elevated and of a more pleasing form; they gradually decrease on the other side of Laguna, which forms almost the highest land on the northern side of the island. The city of this name is situated in a very extensive plain, low in comparison with the heights by which it is surrounded, but very high above the level of the sea.

Here we found the temperature sensibly milder. Many of the fields well fenced, and that the plough in general use was in every respect similar to that employed in the south of France; the woods which cover the mountains and an abundant vegetation induce us to conceive, that this island, so forbidding at first sight, may nevertheless belong to the number of those which the ancients denominated *fortunate*.

Laguna, which equals Saint-Croix in size, is considered as the capital of the island; it declines however daily, both in wealth and population. In passing through it, we observed a fountain similar to that in Saint-Croix, situated in the corner of a large square. Want of time alone prevented me from entering one of the churches pointed out by my companions, in which, they affirmed, they had seen a long catalogue of the books annually proscribed by the Inquisition. They likewise saw in the same church a representation of several *auto-da-fés*, which had taken place at Laguna. In the midst of the flames they recognised the figure of two Guanches condemned to this punishment in order to *reconcile them to the church*! A hundred years have elapsed since the last of these executions took place; and the infamous tribunal from whence they originated is not now so formidable.

The walls of all the houses are covered with plants, which gives the city a mean and wretched appearance. Among

them we particularly distinguished the *Trichomanes*,* the *House-leek*,† and a new species of the same genus.

We went at first to the house of the Marquis of Nava, one of the principal inhabitants; he resides for the most part at Orotava, which he prefers with its arid soil to all the charms of Europe. The house of the Marquis is built entirely of lava, but after the Spanish fashion, and has very much the appearance of the ancient houses of the noblesse in Brittany. A handsome stair-case of white marble, with a massy balustrade, constitute its principal ornament. We were disappointed in our speculations of meeting Legros, whom we had expected to find here.

Legros, who is the colleague of M. Broussonet, came to Tenerife with M. Baudin. In his former voyage, he remained at Tenerife on account of his health. While we were in search of him, we passed under the windows of an inhabitant of Laguna, called M. Savignon, at whose house Levilain had slept; he introduced us to his host, who received us very politely, and presented us with white wine, pipes, and tobacco. M. Savignon is a great lover of music, he has in his house a music-room in which was placed a very good harpsichord, besides an armoury, and a great many devotional pictures hung without order upon the walls.

M. Savignon, the musician, introduced us to his brother, a physician in the island, who is much devoted to the study of natural history. He very obligingly shewed us his collection, which was composed of various curious shells; I could have wished however, that more of them had been indigenous, which might have enabled me to form a judgment of the conchological riches of the Canary islands.

We at last found M. Legros, and were conducted by him to Broussonet and Michaux, who had already alighted from their horses, and were proceeding to botanize.

The name Laguna is derived from an extensive valley, which is on each side nearly equi-distant from the sea, and situated among the highest mountains, in this part of the island. The mountains, by which this valley is bounded on the south, are particularly remarkable for the grandeur of their appearance; and we could readily distinguish towards the south-west the Peak raising its majestic head above the summit of all the others; the vapours, which at first obscured it, gradually disappeared, exposing its sterile and arid sides fully to our view.

* *Trichomanes Canariensis*. L.

† *Sempervivum Canariense*.

plosion, in 1705, Garachico, a flourishing city, was engulfed, and its harbour entirely filled up. We might even have proceeded as far as the mountain of Cahorra, which burst forth about five years ago. It is situated to the south-west of the Peak. I have given some account of it, on the authority of M. Cologan, in my *Essais sur les Iles Fortunées*.

I had it not in my power to accept an invitation which was politely given me to dine this day along with several of our officers, at the house of Don Joseph Pedro Lasca, Governor of the Island, because I waited on board for M. Bernard Cologan, who had the goodness to read along with us all the works we could procure respecting the Canaries, in order that we might ascertain the degree of credit due to these different authors.

On the 12th November, we received a messenger from M. Hamelin, to announce, that he was about to sail. We lay at single anchor; shortly afterwards Messrs. Cologan and Murphy arrived in order to pass the morning with us.

In an hour and a half, the Commodore made the signal for sailing. It was given out that our departure had been thus long delayed, in order to wait for fresh provisions and live stock, which had only arrived this morning. The Marquis of Nava had the goodness to send us the evening before several mules loaded with fruits and other delicacies.

During the time we lay at anchor, I took a drawing of the town, and harbour of Saint-Croix*; an engraving from which accompanies this work. In this, as in all my other delineations, I have uniformly sacrificed elegance to fidelity; being of opinion, that travellers ought never to correct, what may appear, in their eyes, a deformity; but to represent nature in the precise dress in which they find her.

CHAP. III.

PASSAGE FROM TENERIFFE TO THE EQUINOCTIAL LINE.

12th NOVEMBER, 1802.

THE *Géographe* having got under way, found the Cape to bear south-west; we bore up, and in a short time cleared the harbour.

In proportion as we steered towards the south, in ranging along the coast, the mountains appeared to become more elevated; a chain of an immense height, which we estimated at

* Plate I. View of Saint Croix, in the Island of Teneriffe, with the Peak in the distance.

least, at thirteen hundred toises, bounded this part of the coast. Supereminent above the others, we distinguished the summit of the Peak: at half past five, this point bore W. 29° N. As the Peak receded, we could only perceive its extremity; the height of this volcanic mountain is about two thousand toises, taking a medium between the estimates of different authors.

We hailed the *Géographe*, in order to bid a last adieu to our friends. Captain Hamelin informed the Commodore, that we had left fifteen men at Saint-Croix, but had taken on board six strangers; at this moment the man at the helm turned the wheel the wrong way, and we fell so close alongside the *Géographe*, that our yards had nearly got foul of her's. This mistake was, however, attended with no bad consequences, for we instantly got clear, and afterwards kept at a sufficient distance, but it appeared to have greatly irritated the Commodore: as I was in the mizen shrouds, I had an opportunity of seeing him. He came out of his state-room in a violent passion, and, throwing down his hat on the quarter-deck, kicked it before him.

On the night of the 13th, we lost sight of land. The following day, the weather was fine, but the sea somewhat rough; the rolling of the ship was not, however, so troublesome, as to occasion any inconvenience to those on board, although it is not unusual with many individuals, after being some time ashore, to undergo a new attack of sea-sickness on re-embarking.

Our course lay near to some sunken rocks marked on several charts, particularly on that of the Atlantic ocean, in 1786; we did not, however, discover them, and perhaps indeed, they may not exist.

Towards noon we crossed the tropic of Cancer, in about $20^{\circ}\frac{1}{2}$ W. of Paris; we all remarked, that here the sea was of the same colour as on our coasts, and had not that beautiful tint which it assumes in other parts of the ocean. This phenomenon we attributed to the proximity of the African coast, along which we ranged on our passing near to the Pragas, and other banks near to the Archipelago of the Cape de Verd Islands.

From Teneriffe to nearly 10° of N. L. we had a strong gale, the weather continued cold, the sea was rough, and the horizon hazy; the thermometer at noon rose to 21° . After the 14th, we saw several flying fish, which are extremely common between the tropics.

Linnaeus has given the name *Exocetus*, to the genus to which they belong; it would appear that several species are confounded under the same appellation; I forbear, however, for the present, to give any decisive opinion on this subject, and can only regret, that I neither took a drawing of, nor preserved the indi-

viduals, which I procured at different times. I am even unacquainted with the exact figure of the *Exocætus** now under consideration, although it is extremely common and has been frequently delineated.

Wholly defenceless among the voracious inhabitants of the deep, swimming in vast shoals, distinguishable at a great distance by their brilliant and shining scales, the race of the flying-fish must have soon become extinct, had not nature, by endowing them with pectoral fins, enabled them to rise above the surface of the water, in which their enemies incessantly pursue them. I never saw the flying fish rise very high; but I have often observed that they again descended into the sea, at the distance of a gun-shot from the point where they arose. Occasionally, they change the direction of their flight, and rise or fall in a line parallel with the waves; they possess the power of flying in a much more perfect degree than what is generally supposed.

We frequently beheld shoals of flying fish of all sizes, pursued by their enemies: when this is the case, they remain no longer under water than is necessary to moisten their wings; acting, in some measure, like hunted partridges, they appear to slacken their course, whilst they are nevertheless getting a-head of their pursuers. By their repeated flights and immersions, they recal to our minds the idea of pebbles, thrown by children across the surface of a lake or river, which, alternately attracted and repelled by the water, make successive rebounds.

"These poor animals," said Leguat in his *Voyage en deux Iles desertes*, "which exhibit an emblem of perpetual terror, are constantly flying before their pursuers; on ascending, in order to elude their enemies, they frequently darted against our sails; they remain in the air as long as possible, but when their wings become dry, they are forced to descend, because, when deprived of moisture, they only serve the purpose of fins."

It was probably because our ships were much higher than that in which Leguat sailed, that none of them fell into our sails; some of them, indeed, who like Icarus, rose too high above the surface of the water, struck against the sides of our frigates, or entered at the port-holes; but like the adventurer already mentioned, they excited in us only compassion. The air scarcely affords these fugitive animals a safer asylum than the water; for when they are out of the reach of the fishes which pursue them, they are frequently carried off by birds of prey. Equally menaced in both elements, the flying fish seems to possess no other privilege, but that of choosing between the two modes of destruction to which it is incessantly exposed.

* *Exocætus volitans*. L.

On the 17th November, at noon, our latitude was $11^{\circ} 51' N.$ and our longitude $91^{\circ} 8' W.$ of Paris. A month had now elapsed, since we left our beloved country, and we all celebrated the commemoration of this event with equal interest. A large locust, which we mistook at first for a small bird, was observed fluttering about the vessel, and afterwards fell into the sea. On the following days, we saw many others, as well as butterflies and other insects. We were at a loss at first how to explain the appearance of these animals, till we reflected, that their larvæ might be deposited in the vegetables we had taken on board at Teneriffe, and afterwards hatched on our approach to the equator.

The pursuit of the flying fish by the porpoise, *Delphinus phocaena*, L. and ours after the latter, greatly amused me. These porpoises swam with great velocity, and often even more rapidly than ourselves; they frequently forsook us to pursue a different course, but never failed to return very soon, sporting under the bow-sprit of the vessel.

These animals swim together in considerable numbers, and generally in pairs, sometimes, however, two or three in a body, but seldom singly; they in general swim so high in the water, that the dorsal fin is very often seen above it; they occasionally rise to the surface, in order to respire, and resemble bloodhounds in pursuit of their prey, when they raise their snout to throw out the water: on re-plunging, they describe a semicircle, their form being nearly globular, from the extremity of the head to that of the tail. There is reason to believe, that when these animals proceed in pairs, they are composed of a male and female; and when in a larger body, that they constitute a single family, the individuals of which have not yet separated from each other; in this case, there is one which uniformly leads the way, the rest follow in a train almost close to each other, swimming lower in the water in proportion as they are more distant from the first. This habit, which I have observed upon our own coasts, must doubtless be acquired at a very early period when they keep close to the pectoral fins of the mother. These cetacea swim with amazing celerity; they dart forward, wheel about, cross and intersect each other's course, suddenly stop short, rise, and descend, without intermission. The boat-swain, after many fruitless efforts, at last succeeded in harpooning one of them; but whilst we were endeavouring to haul it on board, the animal disengaged itself, and disappeared along with its companions, in the twinkling of an eye; on going off, they raised an immense number of flying fishes, which did not appear so shy as before the departure of these animals.

The thermometer stood at 23° . On the 19th, the weather

was delightful; but the heat was considerable: the thermometer in the evening still stood, nearly at 23° .

Several fishes termed Bonettas, played around the vessel; we succeeded in harpooning one of them, which I recognized to be the *Scomber pelamides*, L. This animal is possessed of extraordinary agility; we have seen it leap several feet above the surface of the water, which it struck violently with its pectoral fins; it darts forward, and again descends with its head foremost.

To-day, for the first time, we met with a white shark, *Squalus carcharias*, L. We likewise saw a swallow, and a *Pelecanus stultus*, L. the last of which rested itself on our sails. Notwithstanding the continual bustle that prevails on ship-board, it is impossible to form any idea of the many hours that necessarily remain unoccupied, or to conceive how much pleasure and amusement is afforded to the mind, by the appearance of a ship, a fish, or a bird, in such a situation.

On the 20th, at six in the morning, the two vessels approached each other, and we had the pleasure to learn, that all our friends on board the *Géographe* were perfectly well: the thermometer did not exceed 23° . The Commodore expressed much dissatisfaction with the slowness of our course, and seemed even to think, that we sailed more heavily than before going into port.

An absolute calm prevailed during the whole of the 21st, accompanied with excessive heat. On the 22d, at six in the morning, we lay to, in order to receive a boat from the Commodore; and had very soon the pleasure of embracing Bougainville, from whom we learned, that we were not forgotten by our friends on board the *Géographe*.

Some porpoises were at this time observed round the vessel. The steersman, on pulling in a line, that he had thrown out the evening before, found that a fish had been taken, which was immediately brought for my inspection. Some of the seamen affirmed it to be a thornback, and others a sword-fish: but as sailors are in general very wretched ichthyologists, they apply these names indiscriminately to several kinds of fishes. The sword-fish, *Xiphias gladius*, L. appeared to me extremely curious; it had followed the ship for several hours, and must have been caught a considerable time before being drawn up, since it was then quite dead.

This animal, particularly from the form of its head and body, bears a striking resemblance to the *Esox belone*, L. horn-fish, and still more especially to the sword-fish. There is likewise some similarity between it and the Scombræ, from the number of its fins, as well as the false fins with which it is furnished. This fish is extremely voracious; as it appears to me not yet to

have been described by any ichthyologist, I have named it the Bastard Acinacea*.

During the whole day the thermometer stood at 26°. Until the 28th, the weather was extremely disagreeable by an almost continual calm, interrupted only by some occasional squalls, accompanied with rain and thunder. The heat was almost insupportable; the thermometer stood at from 25° to 27°. In these eight days, we had scarcely proceeded through one degree of latitude.

During this period, I observed in the ship's wake several small fishes, very beautiful and extremely nimble; these little animals, which appeared to be in search of food, are vulgarly known under the appellation of *pilot-fish*†. I was anxious to procure some of them; but my most strenuous efforts for this purpose proved unsuccessful.

We caught several large Bonettas, and some Tunnies which the sailors term *Great-ears*, on account of their pectoral fins being extremely large, and placed near the head.

On the 26th, during the calm of the morning, we observed to pass alongside, that creature which the sailors call *Galley fish*, and which Linnæus has very improperly termed *Holoturia physalis*. It consists of a sort of transparent bladder, of a considerable size, and of a fine rose colour, inclining to purple, with a kind of keel formed in festoons, and plaited like a ruff, on the upper part. By raising this appendage above water, it makes it serve the purpose of a sail. Numerous tentacula proceed from the under side, and enable it either to seize and devour its prey, or to cast anchor, and fix itself on the moving surface of the waves. This animal is extremely venomous. At this time, we could not lay hold of a single specimen: but another beautiful Mollusca, which I caught alongside, consoled me for the disappointment. The extreme delicacy of this creature's tentacula is, doubtless, the cause of the defective manner in which it has been hitherto known and figured. Linnæus has described a part of a species of the same genus under the designation of *Medusa porpites*. In general, during calm weather, the smooth and transparent sea, to a considerable depth, is filled with innumerable animals, which are visible to a person who has acquired the habit of looking for them, but which are not, at first, easily distinguished, on account of their transparency. Most of these *vermes* are scarcely known to naturalists. Bosc, in his passage from Bourdeaux to North America, observed a great

* *Acinacea notha*, pinnulis supra infraque sextis; dentibus quinque in mandibulo superiori.

† *Gasterosteus ductor*, L.

number; which I have likewise seen, and which, with many non-descripts, might swell the present work. In an account of a voyage, however, it is sufficient to quote the most interesting; which accordingly we shall do, as opportunity may offer.

On the 27th we saw several sharks; but to our great surprize, none of them would take the bait we threw out to them. Others however, which I have since seen, were either more hungry, or more voracious.

The weather still continued alternately calm and boisterous, with frequent heavy rains, which often forced us to take in our sails. During the day the range of the thermometer was from 25° to 27°.

Nothing can be more gloomy, when at sea, than heavy rains accompanied by tempestuous weather; as in this case it is necessary to shut the port-holes and every other opening in the vessel, we are compelled either to remain in darkness, and respire the unwholesome and confined air below, which aggravates the sea-sickness in those who are subjected to it, or continue on deck exposed to all the violence of the storm. To the dead calms with which we had been harrassed for some time, there now succeeded a violent tempest, and although our progress was but small, yet we made this day, the 28th, much greater way than we had done since the 21st.

When the storm was over, and the sky had cleared up, a bird was observed, apparently quite exhausted, resting upon one of the yards; I discovered it to be a goatsucker, in every respect similar to that of our own country*. A sailor attempted to catch it; but having struck it with his cap, the poor animal was stunned with the blow, and fell into the sea. At this period, we were nearly forty leagues distant from the land, towards the south of Sierra Leone. What I considered very extraordinary, was, that during the storm, which appeared to drive the bird in our direction, the wind blew W. S. W. that is, from the quarter on which no land lay.

During the continuance of the hurricane, we lost sight, for a little while, of the Commodore; and a ship which had been seen on the preceding evening, was out of sight at break of day.

For the last ten days, the spoilt water in our casks retained its fetid odour and disagreeable taste, notwithstanding our passing it through the filtering machines of Messrs. Cuchet and Smith, with which the government had supplied us. On taking them asunder, with a view, if possible, to remedy this inconvenience, we found them composed of alternate layers of pulverized char-

* *Caprimulgus Europæus*, L.

coal and sand, separated from each other by a small piece of woollen stuff: the charcoal being saturated with the hydrogen gas, which is the cause of the offensive smell in putrid water, could no longer absorb it. These filtering machines, which we in vain attempted to repair, and whose use we were compelled to abandon, suggested the idea of purifying the water which I kept in my own birth, by mixing a little charcoal with it, and occasionally removing and renewing it, whenever the water acquired a bad taste.

Under these circumstances I found much advantage, from the citrons and oranges, of which I had laid in a store at the Canaries. The juice of such fruits, mixed with the water on ship-board, even without sugar, not only renders it less disgusting, but makes a wholesome beverage in these warm latitudes, where the constant perspiration would produce exhaustion, if we did not thus supply what it carries off.

On the evening of the 30th, while the sailors were dancing and singing on the poop, the boatswain, seated on the sprit-sail yard on the larboard side, attempted to harpoon a porpoise, among a great number of that species which sported around the ship. Suddenly the dancers and the singers were interrupted by the shout of *good luck*, and every one hurried to the fore-castle to see what had been caught: he had in fact struck a supposed porpoise with his harpoon; but dreading lest the animal might disengage itself by a violent effort, he did not endeavour to haul it on board, till exhausted by the loss of blood; he afterwards took another fish of the same species, but still larger.

Seamen apply indifferently the term porpoise to all the small cetacea, or such large fishes as have any resemblance in their form and mode of swimming, to the *Phocæna* of the ancients; they confound this fish with the true *dolphin*, and even with the *Orca*. The animal that we caught was a *dolphiu*; upon hauling it aboard, we found it nearly lifeless.

Both the individuals taken were females; as soon as they were brought upon the deck, the sailors suspended them by the tail, and opened them after the manner of hogs: they yielded a considerable quantity of extremely thick, very warm, and blackish blood. The old sailors extolled the excellence of its taste, and, while it continued to flow, swallowed it in bumpers. To satisfy myself, whether it merited such praise, I was induced to taste it; and found it both, in consistency and savour, very like to milk, into which a small portion of salt has been introduced, but leaving an oleaginous impression in the mouth, and exhaling an odour similar to that of fish.

Whilst Dumont and I were examining the internal organization

of the dolphin, a sudden squall forced us from the deck, and dispersed the crowd of sailors that had collected around us during the continuance of the calm.

Three days elapsed before we consumed the whole of our dolphin; its flesh, although naturally hard and tough, became somewhat more tender by keeping. Our cook dressed it in various ways; but in all of them it appeared to us very indifferent food. We preferred it, however, because it was fresh, to the salted provisions, on which we had mostly lived since our leaving Teneriffe.

Early in the morning on the 1st of December, a strange sail was seen in the N. E. The thermometer did not rise higher than 23°.

On the 2d, we were harassed with almost incessant squalls, during one of which the thermometer fell to 21°. In the course of the night, a sailor brought me a bird which had taken shelter in our rigging; it was the *Sterna stolidus*, L. It was covered with vermin of several species; particularly with the *Pediculus Sternæ, et Columbæ*: the first ran rapidly over the body of the animal; the second, were, on the contrary, fixed to the inner surface of its wings.

The bird on which these pediculi were found, when taken, seemed spent by fatigue; I inferred from the empty state of its stomach, and from its extreme leanness, that it had fasted for a long time. There seems indeed reason to suppose, that all birds which fly far from land can live a long time without food.

On the evening of the 23d, we noticed in the wake of the ship, besides the usual phosphorescent appearance of the sea, very brilliant coruscations, evidently proceeding from considerable numbers of mollusca. We caught several of them, which, on examination, seemed to constitute a new molluscan genus.

The body of these animals is cylindrical, of a firmish consistency, attenuated at one of the extremities, transparent, and somewhat yellowish. Its whole substance is full of small grains of a deeper yellow, while the exterior surface is covered with unequal tubercles of the same nature with the rest of the body. Its only indication of life, was a slight degree of swelling, when molested: its length seldom exceeds five inches, and its thickness an inch; and it is inclosed in a covering or sheath. In outward appearance, it resembles Muller's *Holothuria elegans*. As it emits very luminous scintillations during the night, I have designed it *Monophora noctiluca*.*

The phosphorescence of the sea is such a singular phenomenon, that it cannot be surprising that those who have witnessed it

* *Monophora noctiluca*, oblonga, attenuata, tuberculata.
ST. VINCENT.] F

should endeavour to investigate its cause. In all parts of the ocean, as soon as day begins to decline, a new light breaks forth from the bosom of the waters, and diversifies the gloomy sadness of the surrounding scene.

The foaming and agitated billows are covered with a multitude of luminous points of various sizes; some of them extremely minute, but all possessing great brilliancy. A ship driven before the wind leaves in her track a stream of light, which is very slowly effaced. Flat sandy sea-shores washed by the waves, algæ, or other marine productions left by the returning waters, become suddenly luminous in the dark on the slightest pressure; so that the foot or hand placed on the sand or on the moist fuci, leave thereon traces of light similar to that produced by the presence of the glow-worm.

In certain parts of the ocean, particularly under the line, the whole surface of the waters is illuminated in a very remarkable degree. A bucket of water taken up during the day in these latitudes, in which it is impossible to discern by the naked eye, or even by the aid of an ordinary microscope, any animalcula or other extraneous body, will nevertheless, on being agitated, by the hand in the dark, display the same luminous appearance; and even leave on the fingers traces of phosphoric light. On being kept however for a certain time, it ceases to exhibit these phenomena.

Besides the small luminous particles now mentioned, the sea contains an immense multitude of animals, which diffuse a very remarkable light. We here allude to a particular species of mollusca, by which this property is possessed in an eminent degree. These luciferous animals almost all belong to the class of transparent and gelatinous worms; they have the power of producing a light, which they can spontaneously augment, diminish, or altogether extinguish.

If it had not been demonstrated that the mollusca are hermaphrodites, we might have presumed that nature had endowed the one sex at certain periods, with the faculty of surrounding itself with light, in order to attract the notice of the other.

It seems at first sight that these mollusca, which scarcely deserve the name of organized beings, thrown defenceless upon an element inhabited by voracious and monstrous animals; it seems, I repeat, on this view of the subject, that they have received from nature a transparent form, in order that, by being confounded with the translucent fluid they inhabit, they may escape being altogether exterminated by their enemies. On the contrary, however, why has nature bestowed on them an opposite faculty? Why amidst the security afforded by the darkness of the night,

do they dart as it were out of themselves, and disseminate to a distance, traces of their existence?

What is still more singular is, that on the approach of danger these mollusca should surround themselves with light, as if more certainly to lead to their own destruction. For it is only when injured by the beating of the surges, the dashing of the waves against a hard body, or by the friction produced in the track of a vessel, that we see these gelatinous worms which are so profusely scattered over the surface of the sea, begin suddenly to sparkle, and diffuse around them this luminous appearance.

The analogy which prevails between these mollusca and the microscopic worms usually termed *animalcula infusoria*, is so striking, that we are compelled to conclude that, like the gelatinous mollusca, the myriads of imperceptible beings abounding in sea water, possess the power of rendering themselves luminous at pleasure, that they also exert this faculty when injured, and that it is to this property of microscopic animals the phosphorescent appearance of the ocean must be ascribed. The luminous appearance of sand-banks, and of marine plants, which may naturally be supposed to afford a retreat to a vast number of these salt-water *animalcula infusoria*, affords a new proof in support of the truth of this opinion. But why do not the fresh-water *animalcula infusoria* likewise possess this phosphoric quality? Why in large marshes, wherein such multitudes of animals invisible to the naked eye are discoverable by the help of a microscope, do we not behold something similar to the phosphorescent appearance of the sea?

The mollusca are in general regarded as poisonous; but ought they in reality to be considered so? Has nature endowed them with an instinctive knowledge of their deleterious quality in order that they might remain in safety, amidst the numerous enemies by which they are surrounded? Can they communicate this knowledge to the fishes that might otherwise be tempted to make them their prey?

No accurate microscopic observations, it must be confessed, can be adduced in support of the opinion I have ventured to propose; I am also fully aware that several Naturalists deny the scintillations of the sea are produced by the presence of these animalcula; scintillations very different however from the light produced by molluscous worms. These naturalists believe that the sea, like the earth and air, peopled by an innumerable host of animals, generated only to die, must contain myriads of them in a state of putrefaction; and that as the putrefactive process has been going on for millions of ages, it affords a satisfactory explanation of the phenomena in question.

In fact there is between the ocean and the earth this difference, that the former is always in a state of agitation, whilst the latter remains relatively at rest. In proportion as the organic beings which inhabit the earth cease to live and are decomposed on its surface, moisture, the particular attraction of different substances for one another, their specific gravity, as well as various unknown causes, prepare the elements of decomposed bodies to enter into new combinations, by which means there is an incessant re-production of animal and vegetable life.

In the sea, on the contrary, the effects of the tides, and the influence of opposing currents, prevent those combinations taking place, which are necessary to the formation of new bodies; the remains of animal and vegetable substances, broken by the force of contending waves, are indiscriminately mingled in the agitated waters; hence, perhaps, proceeds the unctuous quality, bitter taste, and remarkable viscosity of sea-water; its brackish taste may originate from the same cause; and to the phosphorus produced by the decomposition of so many animal bodies, has been attributed the luminous appearance of the ocean. Besides, as the pure water of the sea is diminished by the effect of evaporation and other causes, which scarcely at all act on the substances it contains, it should seem, according to this last hypothesis, that the waters of the sea must decrease in proportion to the age of the world, and that its saltness, viscosity, and other qualities, as well as the phosphorescent appearance of the waves, should daily continue to augment.

Such are the ideas which the appearance of this phenomenon produced in my mind; I forbear, however, to give any decisive opinion respecting its cause. I have related facts, and ventured to state some doubts, leaving it with the learned to deduce their own conclusions.

On the 4th we took a Golden-fish, *Coryphæna hippuris*, L. which we had seen on the 1st, swimming before the vessel, and which then got considerably a head of us. The sailors affirm, that this fish is the female of the dolphin; and they add that the male resembles it in every respect, except in being furnished with a crown upon its head. I doubt much the existence of these pretended male golden-fishes, with crowns upon their heads; but it appears, that by the name dolphin, the sailors mean to designate either the *Coryphæna equiselis*, L. or the *Coryphæna plumieri*, L. Be this however as it may, the golden-fish is evidently one of the most beautiful animals of the ocean. It swims very rapidly and with wonderful agility; in the water its tail assumes the appearance of the most polished gold, and its body of the purest silver; its long dorsal fin agitated by a sinuous motion, exhibits an azure tint impossible to be imitated by art. A

variety of brilliant colours are reflected from the body of this animal, according as it is exposed to the rays of the sun. As it is extremely voracious and eager in the pursuit of the flying-fish, we employed, in order to take it, one of them as a snare, from which we reaped considerable amusement. The flesh of the Golden-fish is firm, white, and sufficiently agreeable; at least I found it better than any of the others we had hitherto taken.

We observed near the vessel five or six enormous animals, not less than thirty or thirty-five feet in length; they occasionally threw out the water by a single spiracle situated in the head; the sailors call them *Blowers*, but they were I believe *Giam-puses**.

For nearly an hour six fishes, about three feet long, very slender, with a pointed head terminating in a beak, kept close alongside, or towards the stern of the vessel; they were of a most beautiful brown, with large transverse irregular zones upon the back terminating in the sides, and of a dark green colour. These fishes, which had no relation to any species with which I am acquainted, swam parallel to one another at equal distances, in a continued and very accurate line; if any one of them got a little before the others, it almost immediately resumed its former station.

At day-break on the 5th, we hailed the *Géographe*; and our Captain requested permission from the Commodore, to send a boat alongside of her; which being granted, we availed ourselves of this opportunity to inter-communicate, by means of letters, with our friends; we likewise sent to them, and received in return, presents of some few articles of provision, which a provident traveller ought always to provide when about to undertake a long voyage.

I learned by the letters I received from my friends aboard the *Géographe*, that they had taken a porpoise, three sharks, and a *Porpita radiata*†. They had also like us observed some locusts and several butterflies, the larvæ of which must doubtless have been deposited among the legumes they had taken on board at Tenerife.

The Zoologists aboard the Commodore conjectured that they had come from Africa, and that they had occasionally rested on the waves. It was even mentioned to me that the Captain expressed much surprise, that the squally weather should not have moistened their wings during such a long course.

At five in the morning, our vessel passed near a place where the waves furiously boiled up for about a circumference of thirty

* *Physeter orca*, L.

† *Porpita radiata*, glabra, tentaculis longioribus radiantibus.

feet; and seemed as if they would rise still higher. The officer on watch observed this phenomenon; after which a strong east wind sprung up, similar to that which precedes or follows a water-spout; the weather had been gloomy, tempestuous, and squally, for several days. The thermometer, which in the morning had stood at 19° or 20° , did not exceed at noon 23° , and fell towards sun set to 21° or $20^{\circ}\frac{1}{2}$.

During the whole morning, we were followed by a great number of golden-fishes, which sometimes swam very deep in the water, and at others near its surface. We took five, besides several which again fell into the sea; one of them left a part of its under jaw-bone upon the hook by which it was caught.

The golden fishes, as has been already observed, are extremely eager in pursuit of the flying-fish, and the most certain means of taking them is by bait made to resemble these animals. With this view, the sailors join to a small piece of line, which is a rude imitation of their body, two feathers on each side, so as to resemble wings, the hook forms the tail of the bait, which is attached to a strong cord sufficiently short to be alternately plunged into the sea, and again drawn up by the heaving of the vessel: when the fictitious flying-fish darts from the waves, its enemy pursues it, and is caught in the action of seizing its prey.

Among the golden fish that followed our vessel, I observed several of different hues; the golden-colour was the most prevalent, but some were brown, and a few displayed a mixture of blue and brown; the fins of all of them, however, exhibited that beautiful azure tint, of which it is impossible to convey an adequate idea.

At noon we were in $25^{\circ} 13'$ N. L. and expected immediately to take leave of the northern hemisphere; whilst at dinner we crossed the equinoxial line at $21^{\circ} 25'$ L. according to our reckoning; but the time-keepers placed us much farther to the west; and the Commodore having inquired our situation at half past one, we answered by signal 20° N. L. and $25^{\circ} 6'$ W. of Paris. He shewed us in return, that we were in $19'$ N. L. and $24^{\circ} 21'$ L.; the variation observed by the azimuth compass was 8° N. W. the great difference between the time-keepers and the reckoning may proceed from a variety of causes; the most material of which may perhaps be the influence of the currents in these latitudes.

During dinner, a sailor, habited in the most grotesque manner, entered the cabin and delivered a letter from Neptune and Amphitrite to the Captain, requesting permission to perform the usual ceremony on those who had for the first time crossed the line.

As this pastime is very apt to create disputes on board, Captain

Hamelin replied, that the request contained in the letter could not be complied with, on which the messenger returned very sorrowfully to communicate this intelligence to the impatient sailors. We consoled the crew, however, for their disappointment, by making a small collection for them; we then took from our private stores a few bottles of Bourdeaux wine, and some excellent *liqueur* of Maria Brizard, which we emptied in honour of the friends we had left in another hemisphere; and with whom we had now nothing in common, not even the same seasons. The thermometer stood at 20° in the morning, ascended to 25° at noon, and fell to 21° the moment we had crossed the equator.

CHAP. IV.

FROM THE EQUATOR TO THE ISLE OF FRANCE.

DECEMBER, 1801.

AFTER crossing the line, my mind acquired greater tranquillity. The hope of soon beholding a new land effaced that regret which the recollection of my country had occasionally produced.

From the 10th to the 20th December, the weather was extremely variable, and the sea alternately calm and rough; in the morning, the thermometer stood in general at 20° , it rose at noon to 25° , and fell towards the evening to 22° .

During the night of the 26th and 27th, a heavy squall separated us from the Commodore; we fired a gun, and hoisted a signal at the top-mast without receiving any return; on the following day she was perceived at a great distance to the N. E.

Towards the end of December, the weather was extremely clear and fine; and as we proceeded from the line, the evenings became more beautiful. On the 24th, we were in $19^{\circ} 1' \text{ L.}$ and $27^{\circ} 2' \text{ L. W.}$ of Paris; we expected in the evening to come in sight of Trinity Island, which is usually placed in 27° W. L. and $20^{\circ} 28' \text{ S. L.}$ This island, which is not much known, is according to some travellers considerably elevated, and has every appearance of being volcanic, as well as all the others in this part of the ocean, such as the Island of Ascension, Saint Helena, &c. The white birds which we saw flying at some distance, indicated the neighbourhood of land: some Frigate-birds* appeared also, and approached very near to the *Naturaliste*.

As it is extremely natural after such a long voyage anxiously to expect the appearance of land, I ceased only at the approach

* *Pelecanus aquila. L.*

of night to look out for the expected island. Before day-break, I went again upon deck, in the hope of descrying in the horizon the summits of the mountains; here I found Dumont and Garnier, who like me were anxiously watching for a view of the promised land. A very large frigate-bird at this time hovered perpendicularly over our vessel; it is scarcely possible to convey to those who have never seen it, an adequate idea of the majestic flight of this bird; which suspended as it were in space, apparently without motion, transports itself from place to place without any visible effort: it may be said to swim in the air, as if supported by some invisible power; its head alone is agitated when it turns, stretches out, or shortens its long neck, in darting its piercing looks into the wide expanse of horizon by which it is surrounded, or into the depths of the sea below. Sometimes the frigate-bird lightly skims the waves, after precipitating itself on their surface, with the swiftness of an arrow: sometimes ascending into the highest regions, it is lost in the air, or appears only like a minute speck, which can be perceived with difficulty.

The frigate-bird which hovered over our vessel descended so near to the truck of the main-mast, that Dumont went to fetch his gun, in hopes of bringing it down: but it left its station during the time he was absent, discharging its liquid and oily excrements, which by a laughable chance fell upon the face of the astonished Garnier, who was in the act of viewing it with admiration.

At noon the thermometer marked 24° , in the evening it fell to 19° . We were followed by a great number of bonettas.

During the two following days we still saw some frigate-birds, and the bonettas never deserted us; the nights became extremely cool, and the weather on the whole continued variable and squally.

On the 9th January, 1802, we were at noon in $30^{\circ} 51' 49''$ S. L. and according to the time-keepers in $19^{\circ} 30'$ W. of Paris. The weather was fine, and we saw an unusual number of bonettas accompanied by some tunnies.

It was Captain Hamelin's intention, on our departure from Teneriffe, that the expedition should touch at Tristan d'Acunha. This island was discovered by the Portuguese during their first voyage into these seas, who named it after their Commander; it is still little known, especially to naturalists. Its position is in 37° S. L. and 18° W. of Paris. Lord Macartney, who stopt at this island in his voyage to China, has given a view of it, from an inspection of which I am convinced that the islets by which it is surrounded, must have been separated from it by volcanic explosions.

Petit-Thouars, an intelligent and modest botanist, of whom we shall frequently have occasion to speak, going to the Isle of France, in 1793, in a vessel, the Captain of which stopt to take in water on these unfrequented rocks, took advantage of this opportunity to visit the island; but his zeal for science led him too far from the shore.

There being no appearance of bad weather, the boat returned to the ship; in a short time, however, a violent tempest forced the Captain to put to sea, in order to avoid the danger of being dashed to pieces against the rocks. Petit-Thouars, thus left upon this desert island, passed a night in the most cruel anxiety, which was rendered still more disagreeable by the inclemency of the weather. Stretched beneath a *Phylica*, he directed his anxious looks towards the foaming billows; like another Robinson Crusoe, he already thought of the means of prolonging his existence on a desert land, inhabited by no other human being; Petit-Thouars, however, was not forsaken by hope, and he found himself happy in preserving this benevolent companion.

I know not if our botanist slept under the shade of his *Phylica*, which is of a new species; but I have seen in his herbarium, the plants he collected during his stay in the island, and which are extremely interesting; amongst them are two which form a new genus, and are peculiar to the island of Tristan-d'Acunha. According to the account of Petit-Thouars, this island is nothing more than a very high mountain, nearly in the form of a cone; its summit, which appears truncated, is a thousand toises above the level of the sea; as it is wholly volcanic, there is reason to believe that a greater or less crater exists on its top. The new Robinson Crusoe, wishing to be useful in his banishment, undertook to ascertain the truth of this opinion; but as he clambered up the abrupt declivities, from which immense rocks tumbled upon the least effort, he perceived a vessel which had been sent in search of him, or to leave provisions in case they did not find him on that part of the coast.

It is unnecessary to observe, that Petit-Thouars, when safely on board, examined the plants with which he had filled his botanical box, much more tranquilly than he had done in the island.

From the 10th to the 15th, several Albatrosses* were perceived. We were still, however, more than a hundred leagues from land; and the sight of these birds augmented our regret, that we had not reached the island to which they appeared to retire.

On the morning of the 14th, the weather was extremely de-

* *Diomedea exulans*, L.

lightful. It blew a fresh breeze from N. N. E. the Commodore being about half a league a-head of us, we suddenly observed him lowering a boat into the sea: we suspected that some one had fallen over-board, and suffered the greatest anxiety on that account. Captain Hamelin immediately slackened sail, and took every other precaution in his power to assist the sufferer should he come within our reach; but the boat having returned to the *Géographe*, they were of no service. The uneasiness we had suffered, was soon effaced by the subsequent pleasure we experienced, on learning news of our companions, with whom we at last came up. The Commodore, since our departure from Teneriffe, did not wish our vessels to approach too near to each other, from an idea, that in those seas where there is much danger of being becalmed, it was necessary to remain at about a league from one another, lest the attraction of the two ships might occasion them to run foul of each other.

An intelligent astronomer belonging to the expedition, related to me one day, when we were conversing respecting the Commodore's terror, on account of the supposed attraction of the two ships, a very curious fact, the truth of which was afterwards confirmed by one of the officers. Being in want of a magnetic needle to replace that of a compass which had been injured, he applied to the Commodore, who had several in a drawer of his secretary. M. Baudin, who happened to be in a very good humour, invited him into his state-room, whilst he searched for the box that contained the needles. The steel being somewhat rusted by the humidity of the air, the magnetic property of the needles was considerably diminished. As the astronomer was lamenting this unlucky accident: "What would you wish?" said the Captain, in order to console him, "every thing furnished by the Government has been done in the most niggardly manner: if they had followed my advice, we should have been provided with silver needles, instead of steel ones!"

The early part of this month was gloomy, the wind blew in squalls, varying from S. E. to S. S. E. the sea was for the most part rough, and extremely luminous during the night; on the 19th, we were in $34^{\circ} 29' 15''$ S. L. and $30^{\circ} 42'$ W. of Paris.

On the morning of the 20th, the Commodore hailed us, requesting a supply of rice. At 3 P. M. our boat was sent with it alongside the *Géographe*. I learned that Mangé had killed an Albatrosse, which he had in his possession. Dumont, who was aboard us, had also killed several birds; but our Captain did not think himself warranted to put about in order to search for them, by which means they were altogether lost.

In this latitude, the Mollusca were more abundant than in any other part of our course. We caught several species of them.

The *Beroë ovatus*, BRUG. was very common, and notwithstanding the great light, and its transparency, it was readily distinguishable in the midst of the waves, from the luminous and brilliant colours of the bands, which are disposed upon its roundish body in longitudinal stripes. A still smaller species of the same genus was also very remarkable from its agility, and the elegance of its form: it was nearly globular, and resembled the *Beroë pileus*, BRUG. when deprived of their tentacula. I noticed also, the *Salpa gibba*, Bosc. which exhibited the appearance of the head of a large animal; and with it swam another of the same species very similar to the *Salpa socia*, Bosc. but still more transparent, appearing only like a red point. In all the animals under consideration, we distinguish a sort of capillary net-work formed by very numerous and subtile vessels, of a whiter colour than the other parts of the animal, and which appears to constitute a veinous system. In the *Beroë ovatus*, this net-work is very elegant and extremely sensible. I have not been able to observe it, however, in a very extraordinary animal, which inhabits these latitudes: this species besides display an organization, unknown perhaps in the animal kingdom. The individuals are composed of two distinct parts, which appear to have a very slight connection between themselves. I have named this Mollusca *Scalpa bipartita*.

On the 22d, the weather became still more gloomy, the wind impetuous, the sea rough, and the rolling of the vessel extremely disagreeable; some individuals amongst us had even a return of sea-sickness. We saw several birds; and in particular some Albatrosses approached very near to us. Although these birds have a very large body, yet their wings are so strong as to enable them to remain a long time suspended in the air. We first observed them on reaching the southern point of Africa; and as the inferior part of their body and wings, which are generally seen by the sailor as they hover over the ship, is entirely white, they have hence named them the *sheep of the Cape*. We were still about two leagues distant from land, and nearly half way between Tristan-d'Acunha and the Cape of Good Hope.

From the 25th to the 28th, we drew up a species of small shells with which the sea was covered. The animal to which they belong, being too large for its habitation, swam at a short distance from them, in the same manner as the bombyx flies in the air. It was a new *Hyalea*; I named it *Hyalea papilionacea**.

On the 27th, the weather was fine, the sea calm, and the wind

* *Hyalea papilionacea*, vulva inferiori trifurcata, antice et oblique truncata. N.

blew fresh from the W. S. W. The Commodore having fallen considerably astern, bore up to the S. S. E. in order to join us; he very soon neared us, when we had the pleasure to see our companions belonging to the *Géographe*. I learned that Maugé had been more successful than myself in fishing Mollusca, and that they had also caught a sea urchin*. The Commodore interrogated us by means of his speaking-trumpet respecting the success of our researches; and among other things required our opinion of the sea butterfly, of which they had found so great a number. I conjectured that he spoke of the *Hyalæ papilionacea*, and returned for answer, that it was a species very similar to the *Anomia tridentata* of Gmelin, the only work in my possession that treated professedly on the subject of butterflies.

On the 29th, and the two following days, the weather was gloomy and the sea rough; at noon, we found ourselves in $34^{\circ} 54' 23''$ S. L. and 10° E. of Paris,

On the 1st February, at 2 P. M. we descried a vessel carrying top gallant and studding sails at nearly five leagues distance; at 7 P. M. we lost sight of her in the N. N. W. About 3 P. M. we had noticed a considerable change in the colour of the sea, which was become greenish with some reddish streaks, that we imputed to the currents; from our calculations, we conceived ourselves to be at this time in the neighbourhood of a reef of rocks laid down in this part of the coast, and we attributed the greenish colour of the sea to the shallowness of the water, or to some sub-marine fuci, which might perhaps grow in this place. We besides remarked a very strong marshy odour. The *Géographe* having put about, sounded, and made the signal for no bottom. We requested to be allowed to pass under her stern; and the Commodore having granted this permission, we received news of the persons on board her.

At 9 A. M. the following morning, we descried land to the N. N. E. According to our reckoning we were about twelve leagues distant from the southern extremity of Africa; our longitude by the time-keepers was at noon $16^{\circ} 16'$; the weather continued gloomy, cold, and dreary; we experienced occasional falls of rain, and the sea, which continued greenish, was extremely rough.

We had been followed since the former evening by a great number of Bonettas. A shark passed alongside of us, as well as some bunches of very beautiful *Fuci*. I have unfortunately lost all the specimens which I succeeded in procuring; I caught a very remarkable fish which had entangled itself in one of the parcels of *Fuci*; it was a small *Lophius histrio*, L. three inches

* *Diodon attinga*, L.

long, of a yellow colour, variegated with black, which considerably heightened the singular appearance of this animal. Mangé kept one of them alive aboard the *Géographe* for several days.

A *Ianthina* was occasionally observed by us, and which I conjectured to be new: it differs from the common species* which are blue and semi-transparent, in being opaque and of a violet colour verging towards red. The *Ianthina* are provided with very heavy shells; but they support themselves in the water by the aid of an exterior organ, which is sometimes two inches in length, and three or four lines in diameter; this organ, compressed laterally, is white, extremely vesicular, and filled with air which distends, and renders it tense. I have examined some individuals, in which this organ has been bruised, or even broken off at three-fourths of its length, without the animal appearing to have sustained much injury; I never perceived that it had the power of voluntarily emptying and filling it with rapidity: a small cuttle fish bone was likewise observed to float round the vessel, which I conceived to appertain to a new species of *sepia*, because it terminated in a very remarkable crotchet-shaped point.

Of all the marine animals which fell into our possession, the most rare was certainly a mollusca, of which we never could procure another specimen. We had examined it a long while, before we discovered a shell as transparent as glass, with which it is furnished; and being ignorant at first of the existence of this covering, it had been broken in handling the animal. This circumstance is the more to be regretted, because the mollusca in question forms a new species of the beautiful genus *Carinaria*, which has hitherto consisted of only a single species, and that furnished with the most valuable of sea-shells. I named it *Carinaria fragilis*†. N.

The sea continued to be extremely rough during the following days; and the rolling of the vessel was so considerable, that we could neither sleep, nor sit down to table. We attributed these storms to the neighbourhood of the Cape of Good Hope, which we were about to double, and which was formerly termed the Cape of Storms. Our southern position relatively to the Channel of Mosambique, doubtless concurred in producing this effect, as it is well known that the waters are much agitated in its vicinity.

The weather, however, cleared up, and on the 15th, it was most delightful; several circumstances conspired to render it one of the most agreeable days we had passed during the whole course of our voyage: it was the day previous to Shrove Tuesday,

* *Ianthina fragilis*, LAM.

† *Carinaria fragilis*, stris longitudinalibus, N.

and precisely four months since our departure from France; it was determined that we should celebrate it; and the following day was also dedicated to rejoicing. Captain Hamelin regaled us with excellent cheer; and plenty of Canary wine and punch contributed to render us still more joyous. We also received this day accounts from the *Géographe*, that the fine weather had somewhat re-animated the spirits of her sickly crew.

I was awakened next morning by day-break, to see some *Blowers*, as they are termed, passing alongside of us. They were large cetacea, some of them even thirty feet in length; I distinguished them with sufficient accuracy to ascertain that they belonged to the *Balæna physalus*, L. This species of *Balæna*, which is smaller than the *Balæna mysticetus*, L. and the *Balæna glacialis*, L. appear indiscriminately to inhabit all these seas. As they eject a greater quantity of water than the other cetacea by their spiracles, and as this ejection is accompanied with a remarkable noise, they have been more especially denominated *Blowers*; under which appellation sailors confound almost all the cetacea.

In $33^{\circ} 1' S.$ L. and $38^{\circ} 41' W.$ L. we crossed a line of foam, which was covered with numerous wrecks of marine bodies; there is reason to believe that it marked the course of a current, the direction of which was from S. $\frac{1}{4}$ S. E. to N. $\frac{1}{4}$ N. W.

At the commencement of March, the weather was extremely variable, but in general rather pleasant. The thermometer at noon varied from 21° to 24° . The sea was calm, when suddenly on the 2d, the wind changed to E. $\frac{1}{4}$ N. E. by S. and obliged us to tack; the impetuosity of the wind redoubled, it blew in squalls, frequently accompanied with much rain: we took in our sails, and the wind having shifted to the S. S. W. the Commodore made us a signal, that our course lay E. $\frac{1}{4}$ S. E.

We had only our lower courses and topsails set, when at half past four it blew so high as to split our mainsail. We immediately reefed our topsails, but the gale still encreasing, one of them was torn to pieces. The appearance of the sea was terrible. In a couple of hours the waves seemed to accumulate around us, and to form either mountains, which threatened to dash us to pieces, or valleys which were ready to swallow us up. They fell upon the sides of the vessel with such force, that each shock was as great, as if we had struck upon a rock. The water penetrated every where, and a frightful obscurity prevailed on board: The whistling of the wind through the rigging, and the noise of the seamen joined to the motion of the ship, rendered it impossible to close an eye.

In the morning we had no sail out except the foresail and the foretop-sail. The ~~staysails~~ and the mizen-top-gallant-sail

had been successively carried away. On the 3d, I got upon deck at an early hour to contemplate the effects of the hurricane. The foresail being also split, we were obliged to take it in. We then lay too under the mizen and mizen-stay sail, with the larboard tack on board, and the ships head E. $\frac{1}{2}$ S. All the hatches were shut down, and the sea every moment passed over the deck. The hen-coops tumbling about, the damaged rigging and the masts without sails, presented a complete spectacle of desolation. Scarce any one remained upon deck, and the vessel was left to itself. When a ship lies to in this state, it is no longer necessary for the sailors to keep the deck and expose themselves to the hurricane. Most of them therefore, go below to their hammocks, and wait patiently till the sea either becomes calm, or swallows them up.

We might here take occasion to describe a dreadful storm : to paint the dark humid sky, threatened as it were by the agitated waves ; we might represent the vessel alternately precipitated into a profound abyss, and elevated above the roaring billows, which are quickly dissipated in foam. To heighten the picture it is needless to add, that we were actors in this terrible scene. But I decline the task, since a storm at sea has become a common theme in every book of voyages, and in almost every romance.

During the 4th, the wind successively changed to E. and N. N. E. it then began to moderate, but the weather was not clear, nor had the sea become calm. In the course of the night the obscurity was only occasionally broken in upon by the lightening, which played upon the surface of the waters. These coruscations had no resemblance to the phosphoric lights of which we have already spoken. We fired two guns, in order to indicate our position to the *Géographe* ; but they were not answered.

The weather having become somewhat clear, at 8 A. M. on the 14th, we descried a vessel to the E. S. E. standing athwart us, and soon recognised it to be the Commodore. At 3 P. M. we sailed under her stern, in order to render an account of the damage we had sustained. We learned that during the continuance of the tempest several individuals had been seasick on-board the *Géographe*.

The following days completely effaced all remembrance of the dreadful tempest that we had witnessed ; the sea became more and more calm, the sky serene, and the temperature mild and delightful. I had not been well for some time past, and the late stormy weather greatly contributed to increase my disorder ; I required exercise to recruit my strength, which for some time past was sensibly diminished. The hope of soon reaching land

restored in some measure my tranquillity, of which sickness had altogether deprived me.

Whether the rolling of the vessel, which did not now produce any sensible uneasiness, might affect me in a different manner, or that the sedentary life which we led, was absolutely injurious to my constitution; whether the saline and humid air of the sea that we had so long respired, proved in the end pernicious; or in short, that the scanty and indifferent fare on which we were obliged to subsist, had rendered me scorbutic, I know not; but rest entirely forsook me, I experienced a sense of feebleness in my limbs, accompanied with a very remarkable swelling, especially towards the evening; which with an almost incessant cough and great emaciation, alarmed me considerably respecting the state of my health.

In $19^{\circ} 59'$ L. steering $N. \frac{1}{2} N. E.$ the Commodore made the signal that he was in $56^{\circ} 24'$ E. of Paris, and ordered us to pass under his stern, which we executed; he then informed us we must sail three knots and a half to the W. N. W. and should the weather again become stormy, he would fire two guns in succession, as a signal; the weather, however, continued fine; and on the 13th, when sailing in the wake of the *Géographe*, we descried land at 5 P. M. It was the Isle of France so much wished for, and the Islets which lie to the north of it. At 6 P. M. the Ile Ronde bore W. N. W. The land had now the appearance of a cloud, which begins to disperse towards the end of a gloomy day.

At day-break of the 14th, we were about six leagues distant from the Isle of France; the land stretching from N. to S. presented to our view a chain of woody mountains, gently sloping towards the sea. At noon, the two Mamelles bore S. W. 5° S. the Morne which appeared the most southerly S. 5° W. Ile Ronde N. E. 2° N. the Ile Plate N. N. W. $59^{\circ} 30'$ W. and the corner of Mire N. W. $\frac{1}{4}$ W.

Ile Ronde, which we approached, is elevated in the form of a cone, thirty toises above the level of the sea; it appears arid and almost inaccessible; its shores, which are every where washed by the sea, are rugged and precipitous.

The Island of Serpents, which is much smaller, is a rock nearly five leagues distant from the main land; it is affirmed that small serpents are found here, although they neither exist in the neighbouring rocks nor in the Isle of France.

Ile Plate is somewhat less elevated than the others; a calcareous flat shore of a dazzling whiteness renders it very remarkable at a distance: the rest of these rocks are either of a black or reddish colour. Citizen Lilet, an enlightened officer in the Island of France, who had visited this rock, informed me,

that he discovered in it the remains of the crater of a volcano. It seems indeed probable, that all the isles in question have been formed by the agency of subterraneous fires. Colombier, a naked rock, at a small distance from Isle Plate, is nothing more than an enormous prism of basaltic lava. It is elevated like a light-house, in the midst of the waves: its colour is a kind of reddish brown.

Of all these barren rocks, the angle of Mire is that which is most worthy the attention of the Geologist. Seen from the east, it appears like a small mountain; but on doubling its point, and viewing it from the north or south, it assumes a very different aspect. Divided towards its summit, on the west side, we discovered from its fissures, that it is formed of super-incumbent beds of lava, which have successively flowed over each other. These strata are very much inclined from the west to the east; so that we may attribute the formation of the angle of Mire to the ejections of a crater, which formerly existed in the very place where we are now sailing. Thus, on our arrival, Nature presented to us many facts respecting these rocks, which, although highly worthy of being recorded, travellers have hitherto passed over in silence.

Some grasses and a few palm trees, especially the *Latania Commersonii*, Gmel. grew upon the declivity of the angle of Mire, alternately scorched by the rays of a burning sun, or battered by the most impetuous winds.

Vessels can sail between the Isle of France, and the angle of Mire. It is even affirmed, that the water is not shallow. The sea, however, appears to be here very tumultuous, owing to the action of opposing currents, dashed in different directions by the islets of which we have spoken.

The sky became cloudy, the wind variable and very faint, which forced us to stand upon different tacks until half past six, P. M. when we found ourselves about two leagues and a half distant from the port which we wished to reach.

We fired a gun, and hung out a flag, without any boat coming off to us. The *Géographe* was not more fortunate than the *Naturaliste* in this respect; but having been more favoured by the wind, she anchored E. & N. E. towards eight in the evening.

We stood on different tacks, and sounded several times, without finding any bottom. At half past six, P. M. we at last found ourselves in forty fathoms water; and very soon after, we let go our anchor in fourteen fathoms, with a coral bottom. The wind had wholly ceased, but the atmosphere was a little gloomy.

CHAP. V.

STAY OF THE EXPEDITION AT THE ISLE OF FRANCE—ITS DEPARTURE—AND THE DEBARKATION OF SEVERAL OF THE INDIVIDUALS BELONGING TO IT.

March, 1803.

I WAS so extremely anxious to land, that I could not sleep during the whole night, after we came in sight of the port. Before day-break, I went upon deck, and walked in the fresh air. Never in my mind did the time appear to proceed so heavily. The sky was beautiful, and I clearly distinguished the mountains which environ the town. At last, day began to dawn; and shortly afterwards, we were visited by the health-officers.

The crews of all vessels, on their arrival at the Isle of France, are scrupulously examined by a deputation of physicians and surgeons, since one half of the islanders were carried off by the accidental introduction of the small-pox, about fifteen years ago. The regulations adopted since this disaster, have been strictly enforced; but surely a much safer and less troublesome preservative against the contagious scourge, would be the introduction of inoculation, variolous or vaccine; but the prejudices of the inhabitants, render them averse from engrafting the virus in any form.

After the departure of the inspecting officers of health, a boat, covered by an awning, came alongside, with three commissaries of the colonial assembly. Their object was to ascertain the motives of our visit to the island. After executing their commission, they went on board the *Géographe*: all communication was interrupted with the shore, till the arrival of new orders.

Shortly afterwards, a pilot came on board our vessel: at three, P. M. we weighed anchor, and stood farther in, and again anchored in six fathoms. From the anchorage-ground, the extremity of the mountain Longue bore E. $\frac{1}{4}$ N. E. 2° N.; the watch tower, S. 5° E.; and the middle of Fort Blanc, W. N. W. 5° N.

As soon as leave could be obtained, I repaired aboard the commodore, in order to visit my friends: I there met the commissaries of the assembly, to one of whom, M. Descombes, I

had letters of introduction, which I had not given him in the morning. This gentleman was a captain of a Bourdeaux vessel, an able officer and a worthy honest man. He is one of those individuals to whom the colonists owe the most gratitude for the important services which he rendered them during the stormy period of the revolution.

Except Lieutenant Baudin, Bissy, and Milbert, every one on board the *Géographe* appeared to enjoy a state of good health. While waiting to obtain leave to go ashore, I ran over with admiration the journal of the commodore. It was an immense volume, spread upon a table in his apartment, and which, it seemed, might be examined without indiscretion, since Riedlay and Mauge not only handled it freely themselves, but also shewed it to strangers. This journal contained a multitude of figures of mollusca, fishes, and other objects of natural history, painted in a style of perfection, and with a precision that nothing could surpass. I regretted that these designs had not been sketched by a naturalist, as they might then have been complete: but they were not accompanied with any anatomical details, and the artist had not always represented the animal under that point of view, so as to exhibit its true characters; and as no scientific descriptions accompany these figures, they will not, should they be engraved, prove so useful, as they might otherwise have done, to the zoologist, situated at a distance from the sea, who will not alway be able to form an accurate idea of the objects they are intended to represent. As for me, who had seen the objects here delineated, and who, besides, had myself some pretensions to be considered, at least, an accurate painter, I was surprised and affected on examining these master-pieces of art, and I was anxious to be made acquainted with their author, in order to express the satisfaction I had experienced. They presented to me a young man of a very modest appearance, and who, from a laudable zeal, had embarked as a volunteer, although worthy to have accompanied a scientific expedition in a capacity far more useful to the progress of the arts. His talents having been discovered after he was aboard, he was taken into the employment of the commodore. I was informed, that he had received that encouragement his talents so well merited, by having a similar appointment with the other officers in each party. It is to me a painful feeling to have forgotten the name of this ingenious young man, to whom, doubtless, the expedition will owe still greater obligations.

Not having been permitted to peruse the written part of the journal, I am not competent to form a judgment, if what some of the commodore's enemies affirm, be really true, that it con-

tains nothing useful or worthy of attention, except the drawings of which we have spoken.

I landed near the hospital, in company with Peron, Bernier, and Deslisses. On a cursory view, I conceived no very high idea of the city. The North-west Port, formerly Port Lewis, may contain about five thousand white inhabitants, and double that number of blacks. The greatest number of the streets are unpaved. The houses are mostly constructed of wood, and extremely low: many of them had only apartments level with the ground, or at most a single story, on account of the high winds, which frequently overturn them when built higher. I felt besides, a singular repugnance to behold the Blacks running naked about the streets; which, independent of its indecency, gave an air of misery to the whole place. In our climates, the servants are properly clothed; here, on the contrary, while the white inhabitants pay the most scrupulous attention to their own dress, their domestics are in general filthy and disgusting.

The port was likewise at this time in a very critical situation. The long war had produced a total stagnation of their trade; the credit of individuals was suspected; and the lot of the inhabitants precarious, because the government had not yet secured to them that property they had purchased so dear.

The Isle of France is, at first sight, far from inviting. Persons, however, who have resided in it for some time, leave it with regret, and revisit it with pleasure.

I returned to sleep on board, not having had time to procure a lodging ashore. In the streets of the North-west-port, I culled a rich botanic harvest, consisting of five or six species of *Sida*, several undescribed grasses of the genus *Panicum*, a *Galega*, *Cassia fistida*, *Cleome pentaphylla*, *Boërhaavia erecta*, *Boërhaavia diffusa*, *Andropogon contortum*, *Heliotropium Indicum*, *Cynosurus Indicus*, *Achyranthes aspera*, *Amaranthus spinosus*, &c. Among these plants, I discovered one indigenous in Mexico, the *Argemone Mexicana*; it is now naturalized in the island; and known under the name of Chardon. It is affirmed, that a decoction of its root prevents baldness, and preserves the hair.

The principal streets and squares are planted with the *Mimosa Lebbec*, *Cassia fistula*, and *Terminalia catappa*. The *Mimosa Lebbec* was imported into our eastern colonies from Malabar and Arabia, where it is indigenous: on shedding its leaves, the numerous dry husks with which it is loaded, produce, when agitated by the wind, a very singular hissing noise. During spring, this tree exhibits a most gaudy spectacle; its beautiful tufted flowers, of a white, yellow, and delicate rose-colour, produce an exquisite contrast with its new and luxuriant foliage.

It is one of the gayest of the vegetable tribe ; and nature appears to have lavished on it the means of reproduction with the greatest profusion. Its stamens are prodigiously numerous ; I amused myself one day in reckoning the number of these organs of fructification, in an ordinary tree of this species growing in the court of the house where I lodged ; each head of flowers contained at a medium thirty-six corols, inclosing sixty stamens. The tree this year produced ninety-one peduncles, each of which bore nine heads of flowers : in the whole 32,724 corols, and 1,996,164 stamens. It yields, like all the other *Mimosa*, a gum, but in a much greater quantity, similar to gum Arabic*.

When the two corvettes appeared off the coast, they excited considerable apprehensions among the colonists.

As soon as all business is concluded at the North-west port, it is usual with many of the inhabitants to retire to an elevated spot in the neighbourhood, which is named the Little Mountain, from which they can command a full view of the road. Here they converse on political subjects, and regulate the interests of nations, in the same manner as is customary in the coffee-houses of the Palais Royal, at Paris. When we were first descried from the Little Mountain, it was generally supposed we were the van of an English fleet destined to make an attack upon the island ; afterwards they conjectured that we might be from the mother country ; and when confirmed in their suspicions, the first question put by the colonists to each other was, what could induce her to send them ? It cannot appear astonishing, that during the stormy period of the Revolution, and whilst the principles of the French government were radically wrong, such Frenchmen as had the good fortune to shelter themselves from their fatal effects, should tremble at the sight of a flag, which, till now, had so often excited their fears.

Witnesses of the misfortunes of St. Domingo, and operated on by the conviction that it was impossible to break the fetters of their slaves without subjecting themselves to similar misfortunes, the inhabitants of the Isles of France and Bourbon took an oath, at the commencement of the Revolution, to remain faithful to the mother country ; but they swore, at the same time, to die rather than suffer their wives and children to be exposed to the barbarous licentiousness of half-civilized negroes, who, ignorant of the true nature of liberty, might be easily induced to shed the blood of their masters. By adopting this resolution in direct violation of the law which abolished slavery, the colonists equally exposed themselves to the ven-

* A perfectly similar gum may be obtained not only from all the species of *Mimosa*, but also from many other trees, such as the *Sweetenia febrifuga*, *Melia azadirachta*, and the different species of *Terminalia*. T.

geance of the mother country, and to the danger of falling under a foreign yoke. For a period of eight years they remained in a very precarious situation, constantly surrounded by those who might, at one moment or other, become their assassins; and having no other prospect but that of falling beneath the dominion of Great Britain, or of perishing by the hands of their own negroes, stimulated by the engagement which the French government had contracted with all citizens to aid them in the recovery and maintenance of their liberties.

It would be endless to recount all the various acts of heroism and magnanimity displayed by the inhabitants of the Isle of France, during this disastrous period, in causing the national flag to be respected in the Indian seas, in obviating the destructive measures employed against them by the mother country, in maintaining tranquillity in a season of general despair, and in preventing, without bloodshed, those commotions which might have endangered the public repose.

It is not the province of the traveller to record historical facts; I shall leave it, therefore, to those who have witnessed these events, and participated in the danger and the glory, the care of publishing them to the world, and of proving by the recital, what a few determined men can accomplish. We can scarcely avoid shuddering when we reflect on the situation in which the white inhabitants of the Isles of France and Bourbon were left for so long a period. Scarcely had they learned on our arrival at the Isle of France, that a salutary change, terminating a bloody revolution, had placed a *Pacificator* at the head of the government; this news not having been fully confirmed to them, and the colonists having for a long time resisted the directorial tyranny, they dreaded a terrible though tardy vengeance on the part of the French government. Hence their alarm may be easily conceived, when they thought they recognized the French colours, and imagined that we brought with us agents from the mother country commissioned to inflict upon them the most exemplary punishment. On being undeceived in this respect, and learning that the Directory had been hurled from its iron throne, some of the most restless colonists, and who knew only the character of our chief magistrate through the medium of the calumnies propagated against him in the British newspapers, disseminated the idea that the title of an expedition of discovery was only assumed as a pretext with a view of facilitating our introduction into the colony, and to prepare the way for a greater number of agents who were to follow. On afterwards mentioning this strange idea which had been at first conceived of us, to many of the inhabitants, friends of the new government, several of them replied, "We formerly knew your Commodore,

M. Baudin, and we believed him capable of such conduct." In fact, it is a circumstance of public notoriety, that as soon as the name of Commodore Baudin was mentioned, all communication with the shore was prohibited, and we were ordered to proceed elsewhere.

Général Magallon de la Morlière was then governor of the island. He was the worthy son of one of our greatest warriors; his name struck terror into the English; he promoted the public good by every means in his power, and his virtues proved a support to the colonists under all their oppressions.

He had succeeded to the weak but well-meaning Lieutenant General Malartic, as commander in chief; and for a long time pursued the same conciliatory measures. As soon, however, as he learned that a new government at home had acquired sufficient stability to ensure public tranquillity, he assumed a more determined line of conduct towards the Colonial Assembly; and insisted that we should be received without farther hesitation.

At the North-west port I met with many of my early acquaintances, whom I had not seen since I entered into the army. During our stay, I, as well as all the persons belonging to the expedition, experienced the most cordial reception; and it is but justice to add, that no people could be more hospitable than these islanders. They all evinced the greatest eagerness to accommodate us with lodgings; for my own part, I accepted a bed at the house of M. Descombes.

I was anxious to see M. Petit-Thouars, who had, for many years, resided in the island, and whom, as yet, I knew only from his high and deserved reputation. I introduced myself to him as a young man attached to the study of nature, and eager after the pursuit of science. He received me in the most friendly manner; and, on the third day after our arrival, accompanied several of us on a botanical excursion. It was during this expedition that I became acquainted with M. Dumorier, who died soon afterwards, universally regretted by all who knew him. Equally virtuous and intelligent, he was justly considered at Bourbon as the patron of the sciences. I had flattered myself with having the pleasure of travelling with him into the interior and mountainous parts of the island, when death unfortunately snatched him from us.

We visited the Isle aux Tonneliers, on the 21st March, in order to acquire some information respecting the natural history of the torrid zone. This long and low island has been joined to the main land through the exertions of M. Tromelin, by means of a causeway upwards of eight hundred feet in length. The whole island appears to be composed of marine bodies, and

fragments of shells, or madrepores; in several places, however, volcanic rocks are observable, which seem to have been forcibly detached by the waters from an inferior stratum, which is covered with the remains of animal bodies. In the Isle aux Tonneliers, the heat, when not moderated by breezes, is almost insupportable, owing to the powerful reflection of the sun's rays from its arid and white soil, and the want of wood on the island. It could only be seen at a very small distance, and on a level with the water; it is not cultivated, and we observed no other habitations but those connected with the forts erected in the island. During two-thirds of the year, the Isle aux Tonneliers presents, in the midst of the burning heat of summer, the aspect of our winter. The verdure, which decorates a part of its surface, is parched by the heat; and the forests, despoiled of their underwood, exhibit only thickets destitute of foliage. But when we visited this spot in company with Du Petit-Thouars, and Dumorier, it seemed as if nature had wished to display before us those riches of which we were ignorant. I made an ample collection of rare and valuable plants, among which, a beautiful *Tournefortia argentea*, Lam. a *Scavola Kanigii*, Lam. and a small *Phyllanthus*, Lam. fully leaved, gave me the greatest pleasure. I was likewise delighted to find a *Vinca rosea*, L. which we cultivate in our green-houses, and of which it constitutes the principal ornament, but which, in the Isle aux Tonneliers, spontaneously displays its elegant shades. The *Verbena nodiflora*, L. which grows in Sicily, and which I found at Teneriffe, flourished here in great profusion. Bosc has also brought it from New England.

I shall not stop here to enumerate the names of all the other plants which I discovered; the sight of them, and the insects which sported around them, re-animated my taste for scientific pursuits, and so deceived me with respect to the real state of my health, that I supposed myself capable of supporting all the fatigues attendant upon the most tedious excursions. I therefore determined, in a very short time, to set out for the *Camp de Masque*, situated in the district of Flac, where I was engaged to spend a few days.

The North-west Port is the only city in the colony; but the island is divided into eleven other districts, named Poudre d'Or, Pamplemousses, Flac, the *Riviere des Ramparts*, the Trois Ilots, the Great Port, the Savanna, the Military Quarter, Moca, the Plains of Willems, and the Plains of Saint-Pierre.

Flac is one of the oldest. The Dutch had a settlement there in 1693, called the Lodge, and it was there Leguat landed in the island.

Moca, and the Plains of Willems, are, on the contrary, very

recently settled. Scarce one-fourth of the military quarter is yet cleared.

The Great Port was the first establishment in the island. It was the chief residence of the Dutch in 1598.

I prevailed on Dumont to accompany me to the country. We set out at an early hour. M. P——, whom we visited, was so kind as to send horses to convey us to his house. We were, however, no sooner clear of the town, than our passion for botanizing and shooting tempted us to alight, and proceed on foot. Every thing struck us; every thing was new.

Unacquainted with the customs of the country, and acting only on a feeling of humanity, we directed the Negroes, who were sent to conduct us, to ride our horses, or at least to load them with the bundles they had to carry themselves. Our attendants were, however, far from taking this advice, and the horses performed their journey of eight leagues very much at their ease.

Here a fern, there an olive, arrested our attention; and as we advanced, some beautiful butterfly frequently drew us aside from the path we ought to have pursued. It was noon when we arrived at the river Rempant, which was about halfway. Three gigantic palms rose majestically in the front of a house, situated on the side of the bridge, and we rested ourselves under their shade. The Blacks informed us, that they were named *Rafia*. (The *Sagus* of the *Encyclopédie Méthodique*.)

The *Rafia* is a native of Madagascar, where its leaves serve to make a sort of aprons, and other vegetable coverings. This vast tree may be said to have no stalk, or at least a very indistinct trunk. It is composed of leaves from fifty to sixty feet long, the lignous nerve of which is very strong, and canaliculated. These leaves are disposed in the form of plumes, the one surmounting the other, and the outermost being always of the largest dimensions. I never saw a tree more elegant and majestic than the *Rafia*.

Among some marshes, not far from these palms, I found a *rush*, which resembled in miniature the *Papyrus*, cultivated in the Garden of Plants at Paris. It was of a very distinct species, probably the *Cyperus prolifer* of Lamark.

We advanced into the deep wilds of the wood. The parts into which we entered, had only been recently penetrated for the first time by the inhabitants; and even those spots which were cleared, still exhibited the majestic rudeness of Nature, long abandoned to her own strength. Here, trees quite different from those with which we were generally acquainted, attracted our notice at every step; but none so much excited our surprise as the Arborescent polypody *Polypodium arboreum*, L. *Cyatæa arborea*, Smith. This plant affects the form of a palm-tree.

ST. VINCENT.]

I

It rises to the height of twenty-five feet. Its foliage, which is of the finest green, and most elegant form, composes real leafy parasols.

M. P——'s house was situated in the midst of the wood, between two mountains, one of which formed a semi-circle, and partly circumscribed his property. A basin, formed by the heights, presented a most enchanting point of view at the extremity of the gloomy forest, through which we had passed : but our fatigue was so great, that we were unable to enjoy this delightful prospect. I never felt so much the want of rest. The heat and the exercise had completely exhausted me.

We went to bed at an early hour ; but I had scarce closed my eyes, when I was awaked by Dumont, who was seized with a violent pain in the stomach, accompanied with ardent thirst and vomiting. I was obliged to assist him as well as I could in the dark, for we did not choose to disturb the family by calling up any person. It appeared that his illness had been occasioned by a ragout, of which he ate freely at dinner ; and another gentleman who partook of it, was also indisposed. This ragout was prepared in a copper vessel, and had doubtless been impregnated with verdigris.

Dumont was troubled with a pain in his breast : though large of stature, he was far from being robust, and this accident produced a complete change in the state of his health, which had already been much weakened by the voyage ; the violent exercise which we took on the following days, contributed not a little to prevent his recovery. The country, instead of being favourable, was injurious to us, and we returned to the town much worse than we were when we landed.

I have related this circumstance respecting Dumont, because that worthy young man has been strangely calumniated. Those who sought to blacken the characters of such members of the expedition as stopped at the Isle of France, reported that Dumont had a rich brother in that colony, and that for the purpose of getting out to him, and avoiding the conscription, he had procured the insertion of his name in the list of naturalists. I cannot pass over this slander in silence, because I know that Dumont is not the only one amongst us who has been basely calumniated. Had Dumont had a rich brother in the Isle of France, I should not have been obliged to seek a surgeon's place for my colleague, in order to supply his wants. In a word, he would not have had occasion to recur to the assistance of his friends in a thousand instances. He was, besides, turned of twenty-eight, and, consequently, was not a conscript.

When we sailed from Havre, our captains had received considerable advances for supplying the staff of each vessel with pro-

visions for six months. On our return from the country, we learned that the six months having expired, there would be no table kept on board, and that each person must lay in a stock for himself. This circumstance proved a cruel disappointment to many of my companions, who, though full of zeal for the progress of the sciences, possessed little or no money, and knew not how they were to exist. The colony was at this time drained by the expences it had been at for its own protection during eight years, and could afford no assistance to the expedition. In consequence of this state of things, not only no provision was made for our tables, but all that could be afforded towards provisioning the staff during the remainder of the voyage, was some rice, and a kind of spirit distilled from sugar, which they called arrack.

As the sums which the captains received at their departure for our maintenance, were very considerable, and as we had been supplied with great economy, we hoped that, from a laudable foresight, they had reserved one half of the money for laying in a fresh stock of provisions, in case the government of the Isle of France should not be able to answer their demand; but this hope was disappointed. There were, however, many individuals in the Isle of France, who considered it their duty to give an asylum to the men of science belonging to the expedition; and when the corvettes sailed, almost destitute of every thing, several of my companions, who prosecuted the voyage, received supplies of different kinds of provisions from persons whose esteem they had gained during their stay.

Belfin, whom I consulted respecting my health, and who was alarmed at the state in which he found me, gave me a sick-ticket, by means of which I was admitted into the Marine Hospital. In this establishment I was placed under the care of M. Laborde, an amiable and skilful physician, whose good humour inspires with confidence the patients his science cures. His prescriptions related chiefly to regimen. He advised me to live in the country, to take moderate exercise, and breathe the pure air of the Isle of France, which very often restored persons in my state, in a short time, to perfect health. The country, however, to which I returned, proved injurious to me, for I took too much exercise, constantly forgetting that I had come there to be cured, and not to gratify my taste for natural history.

In one of the excursions undertaken for my recovery, but which failed to accomplish that object, I had an opportunity of surveying the coast from the mouth of the river of the Pataniers to Turtle-Bay. Fishing frequently, in company with others, along the coast, I picked up several species of marine animals, which deserve to be noticed; and, among others, one which the

Blacks call the *purse*, and which indeed was the most singular I met with. The purse is the *Tetraodon testudinarius* of Linnaeus. It swims with velocity under the water, and when it wishes to rise to the surface, has the power of dilating the skin of the belly, until it assume an ovate form, which gives to the animal a great degree of specific levity. When caught, it may be compelled to perform the same operation. If sufficiently irritated, it inflates the skin until it becomes quite hard and round, and then the little bristles which cover it are erected. These bristles, however, do not appear to be very formidable arms, for I could touch them with impunity. When the skin is very much distended, the animal is scarce capable of directing its course in the water; it turns and tumbles about, as if it had lost all power of regulating its motion. A much longer time is occupied in discharging the air, than in its admission. The Four-spined Trunk-Fish *Ostracion quadricornis*, L. is very common here.

I found also several kinds of star-fish, some of which were the same as those met with on our own coasts; some mollusca, which I now saw for the first time; and a great variety of crabs. These, joined to the fishes we caught, afforded me ample materials for several days study.

We had been now a month in the Isle of France, and my health, instead of improving, grew daily worse. At last, I began to think seriously of taking care of myself, in order that I might be recovered on the departure of the expedition. Good health was absolutely necessary for the further prosecution of a voyage, in which we were to be deprived of every thing by which a long continuance on shipboard could be rendered comfortable. The provisions were bad; and in case of sickness, the patients must have recovered as well as they could, without any medicine. It might have happened by mistake perhaps, but it was a very extraordinary circumstance, that the medicine-chests were sent ashore by those who were employed to land about eighty large bales and boxes, marked B. Even barrels of nails, which had been put on board for the use of the ship, were also disembarked; and afterwards, I saw all these articles exposed to sale in an auction-room, called the *Lighter Magazine*. This magazine was recently opened, and established on a more extensive scale, than any thing of the kind that had been seen since the commencement of the war. It contained European merchandize to the value of 300,000 francs, which, it was said, had been landed from our vessels, and on which a profit of from two to three hundred per cent. was gained. It was remarkable too, that about this time all the coquettes of the country began to imitate the dress which was worn by the fashionable females of

Paris at the period of our departure. The things which, when we left France, were stiled in the vocabulary of fashion, *mugnets*, *esprits*, *fleurs*, &c. were profusely distributed over the colony. A milliner paid 7,000 piastres for only three of the bales, marked B, which contained nothing but articles of this sort of luxury.

The author of this speculation, whoever he was, had omitted nothing to render it successful. These three bales of tawdry rags were accompanied by complete collections of the caricatures called *Costumes Parisiens*, which were sold along with the articles of dress they represented. There were also dolls decked out in the pink of the fashion, and a number of little hats intended to serve as models. Materials for fitting up a complete printing-office, were likewise landed from our corvettes. Before we arrived, there was only one fount of types in the island, and they were completely worn out. The presses we brought out were, therefore, soon the only ones employed, and in a short time produced considerable profits to their proprietors.

The expedition now began to fall into a state of disorder. The commodore resided almost always in the country. He was invisible to all of us: far from having, according to custom, presented the officers of his staff to the principal personages in the colony, he appeared offended when some of them waited on the governor and the intendant. He often declared, that half the members of the expedition were of no use, and that the Institute had sent aboard a number of *philosophers*, while he had only occasion for *collectors*. These offensive expressions could not but be painfully felt by those to whom they were applied. The geographers and astronomers, in particular, were far from agreeing in opinion with M. Baudin, who pretended that his own officers were sufficient for the geographical and astronomical department. Besides, he used to observe, that he would rather discover a new mollusca, than a new island.

M. Magallon, who was not acquainted with the *useless philosophers with whom the Institute had overloaded the expedition*, but who did not judge of them by the commodore's assertions, received with distinction every one who waited on him. The marks of esteem which he more particularly bestowed on Michaux, afforded all of us real pleasure, for he had a great influence over us: he was our senior, and we all respected him as the chief of the expedition.

We had, however, reason to apprehend, that the bad health of Garnier, Gikel, Bony, Cap-Martin, Baudin, and Mißbert, would oblige them to separate from us. Deslisses and I, who were still more indisposed, were uncertain what to do, on

the sailing of the expedition. I, at last, determined to be regulated by the advice of my physician. Deslisses, on his part, resolved to follow the example of Michaux, who being convinced that he could be of no service to the expedition, managed as it was, and having reason to take to himself a part of the sarcasms bestowed on the *philosophers*, wrote to M. Baudin, that he considered himself only as a passenger on board his ship; that his zeal for natural history was sufficiently known to protect him against the suspicion of having quitted the expedition, from any other view than that of promoting the interests of the science to which he was attached, and that, consequently, he must not depend any more on him; and that it was a part of his plan to remain at the Isle of France, and to write the natural history of Madagascar.

The commodore had no expectation of this occurrence. It appeared, that he thought he could compel us to follow him; but he never imagined that Michaux, whose reputation was not to be injured by any thing he could say, would be the first to abandon him. He was, besides, vexed that we had been landed on account of indisposition; for otherwise he would have represented our staying behind as indisciplined. He, therefore, became much more mild and civil. He tried to conciliate his officers, in the hope of making a party among them against us; but in this he could not succeed. He then called the members of the expedition together, under the pretext of considering in what manner they were to subsist during the remainder of the voyage, and pretending to regret the unfortunate situation of his passengers, offered them his table. On this occasion, however, my friends made him sensible of the esteem they entertained for each other. They all answered with one voice, "Hitherto, while on board, we messed with your officers; but now that they are about to be reduced to biscuit and water, we shall share their hard fare with them. We will not sit down at your table, unless your officers mess with you also." This reply did not satisfy the commodore, and no new supply of provisions was procured for the officers mess.

Peron, Milius, Bernier, and Faure, were also at the hospital. I envied them their recovery, and trembled at the idea of not being able to follow them. In this state of cruel uncertainty, struggling between the desire of accompanying my friends, and the fear of falling a sacrifice, in my state of health, to an expedition so ill directed:—in this situation I continued fluctuating, anxious and irresolute, until the moment I learned that the commodore had fixed the sailing of the expedition for the next day. My mind was now enfeebled by indisposition, and, under all these circumstances, finding myself incapable of forming any re-

solution, I implicitly followed the directions of M. Descombes. I proceeded to the port to bid farewell to my companions, who were collected there, and departed for the country, without informing them that I would see them no more.

CHAP. VI.

STAY AT THE ISLE OF FRANCE, AFTER THE SAILING
OF THE EXPEDITION, UNTIL MY DEPARTURE FOR
BOURBON.

THE plains of Willems extend towards the centre of the island, and are situated between the Great River, which we cross at its mouth in order to reach them, and the lofty mountain of the *Corps-du-Garde*, the sides of which, divided towards their summit, are distinguished from every point. It was at the season when they were clearing the ground, and pruning the venerable woods, where M. De Saint-Pierre laid the scene of his interesting history of "Paul and Virginia."

On arriving on these plains, I recalled to remembrance the unfortunate Paul, insensible to all the consolations of his venerable friend, seeking the object of his affections in the same spot where I hoped to divert the melancholy sadness which oppressed me.

With this view, I wandered in quest of adventures; and on the morning of my departure, before day-break, I repaired to the foot of the *Corps-du-Garde*, which I ascended in company with a young native. By the first rays of the sun, which gilded the summits of the vast forests, with which the interior of this island is still covered, we discovered the *Géographe* and the *Naturaliste* at a considerable distance from the coast. Relinquishing my botanical pursuits, I seated myself upon the projection of a rock, and followed the corvettes with my eye, until they disappeared in the horizon. On descending from these rude heights, I offered up my prayers for the success and speedy return of an expedition I could no farther accompany.

The mountain of the *Corps-du-Garde* is elevated above four hundred fathoms above the level of the sea. As it is isolated, its summit attracts a great quantity of vapours, which frequently conceal it from the sight, so that the signals made from it cannot always be observed; but when the sky is clear, and we reach the top of the *Morne*, a most delightful prospect opens to our view; part of the land adjoining the coast is cleared, and ornamented by houses, cultivated fields, and beautiful gardens; whilst

interrogated these palm-trees, the murmuring of whose leaves seemed to say to me that Paul and Virginia had really existed; and that they had sighed under the same shade where I now mourned over their untimely fate. I conceived myself surrounded with witnesses of their happiness and their misery. I no longer hesitated to believe that M. de Saint Pierre had written a true history, notwithstanding the evidence of the inhabitants, who had never heard of the young Creoles of the *Anse des Prêtres*, but from the author of the *Studies of Nature*. But whether Paul and Virginia were really the offspring of the imagination of an eloquent and virtuous man, or were actually the inhabitants of these solitary retreats where I now cherished their memory, I became so absorbed in their history, that I supposed myself assisting at their sports and partaking of their toils; a Black who passed loaded with wood, I transformed into the old Domingo; and a Negress returning from the forest, recalled to my recollection his laborious companion; or if by chance the dog of some wandering hunter disturbed by his barking the pleasing melancholy of my mind, it was the faithful Fidele which drew me from my reflections.

The humidity occasioned by the clouds, which, as I have already observed, frequently envelope the summits of *Piter-Boot* and the *Pouce*, greatly contribute to promote vegetation: hence the plants growing upon the top of these mountains, are in general vigorous and healthy, whilst those on their arid sides languish and become sickly. I frequently directed my botanical excursions towards these heights, where I found a variety of plants of the greatest beauty. Among which the *Lycopodium phlegmaria*, *L. Flabellatum*, &c. are distinguished for their elegance.

There are now very few date-trees in the neighbourhood of the north-west port, or indeed, in any part of the Isle of France.

I availed myself of the first leisure moment to visit M. Cère, director of the Garden of *Pamplemousses*, to whom I brought an introduction, being anxious to view his interesting plantations.

The district of *Pamplemousse* is bounded by that of *Poudre d'Or*, the *Montagne Longue*, and the sea. It is a low plain, intersected by the river which bears its name, and by that of *Tombeau* which receives the waters of the *Calebasses*. Indigo, various kinds of provisions, and sugar, form the principal products of a district whose soil is in general parched by the heat of a burning sun; there are however some spots extremely rich and marshy. In these places they cultivate rice, and here as well as along the banks of the river, I found many interesting plants.

It is in the district of *Pamplemousse*, that the king has reserved a considerable extent of ground, a part of which is occupied by the garden I came to examine.

How singular did this garden, or rather this field, planted with all the rare trees of India and other warm climates, appear to me. Long alleys of Palm-trees crossed each other in different directions, canals of running water flowed through the grounds, and the fences were composed of bamboos and other shrubs not much known.

Among the numerous trees with which this garden is planted, I especially remarked the *Laurus cinnamomum*, *L. Laurus cassia*, *L. Piper nigrum*, *L. Piper betel*, *L.* and a species of *Strychnos* indigenous to Madagascar, the fruit of which is eaten by the inhabitants.

M. Cère pointed out to me in particular three extremely vigorous and beautiful bread-fruit trees, which are highly prized by the colonists. This tree so celebrated by travellers, belongs to the genus *Artocarpus*, *L.* I shall here only observe, that for my own part, although convinced that the bread-fruit may become very useful in our colonies, I am far from thinking it so exquisite as some people are willing to have it believed.

On quitting the garden, I looked in vain for the long avenues of bamboos which led to the church of *Pamplemousse*, and of which M. Bernardin-de-Saint-Pierre has spoken, for except in the garden, I saw very few of these plants; the church itself, which resembles one of those in our very poorest country parishes, is situated on a mound of earth adjoining to some barracks.

The number of birds in the Isle of France is not considerable, among others we noticed the *Loxia orizivora*, *L. Loxia Madagascariensis*, GMEL. *Paradisea tristis* GMEL. and the *Psittacus canus* GMEL.

We met with several species of *Scolopendra**, among which was a very large one, whose bite is extremely painful, even much more so than the sting of the scorpion; which is here very small and extremely common: they multiplied rapidly in my herbarium, and proved a defence to it against the attacks of the *Cock-roaches*†. This last animal is perhaps the greatest scourge in the Isles of France and Bourbon. It was originally brought from America, and is now very widely disseminated. Those who have inhabited warm countries, know from experience how extremely troublesome these animals are, and how rapidly they increase on ship-board.

* *Scolopendra morsitans* GMEL.

† *Blatta Americana*.

The *Cock-roach* has, it is said, a formidable enemy in the green-fly, *Sphex lobata* FABR. which is of a brilliant metallic colour, of a form as elegant as that of the former is disgusting: it is likewise possessed of astonishing alertness and vivacity. It is seldom seen but on the wing; or if we even observe it in a state of rest, its antennæ or its wings are always in motion.

When it wishes to deposit its eggs, it selects a large *Cock-roach*, around which it flutters until the animal becomes stupified by this continual motion; it then suddenly darts upon it, and plunging its sting repeatedly into the large belly of the poor animal, drags it by means of its long antennæ into a hole previously prepared for its reception. Here it deposits its eggs in the sides of the *Cock-roach*, closes the orifice with a kind of gluey matter, and abandons its victim to the voracity of its progeny, which are very quickly evolved.

It is truly unfortunate that this war carried on by the green flies upon the *Cock-roaches*, should not prove more destructive to the latter, which are extremely disagreeable by their odour, their importunity, and the mischief they occasion. They destroy every thing that falls in their way, even the bindings of books are not safe from their depredations; and the greatest precautions are requisite to preserve a library in the Isle of France. A *Cock-roach* one evening devoured the surface of a little table of cinnabar which I had left moistened upon a table where I painted. Next day the same animal escaped from between the leaves of the manuscript of the Voyage I was writing, when I crushed it by a blow with my ruler; to my great astonishment I observed, that it stained the paper of a most beautiful colour approaching to carmine, which remained a long time without losing any of its brilliancy, and without being altered by the action of water.

The *Cock-roach* serves the purpose of a barometer, as they uniformly leave their holes on the approach of rain; they fly about with considerable noise, and frequently fall into the dishes during dinner.

The *Musquitoes* are not so disgusting as the *Cock-roaches*, but they are more to be dreaded on account of the pain which is occasioned by their sting. In the Isle of France, as well as in all the warm countries of Asia, they are extremely numerous and very troublesome towards the evening, especially to strangers.

The *Cock-roaches* and *Musquitoes* are not the only disagreeable insects with which these climates abound: ants and a species of yellow-fly, *Vespa petiolata* FABR. are still more destructive. Notwithstanding all my precautions, and surrounding my collections with water, I was twice robbed by the former in

the course of two or three days. On a third occasion I had placed my boxes one upon the other, and placed them on a kind of pedestal, the base of which was surrounded with water two inches deep. During my excursion to *Piton*, in the centre of the Island, these ants constructed a bridge across the water, by means of several straws, and having reached my boxes by the aid of this invention, they once more robbed me of all my entomological riches.

In the large forests, we often perceived upon the trunks of the trees enormous masses of a brown colour, and of an irregular and roundish form. On examination they were found to contain a variety of cells, with winding roads of communication formed of a kind of tan solidly agglutinated, and which were constructed by a species of insect belonging to the genus *Termes*.

This animal, *Termes destructor* FABR. is less than the *Termites* of Africa, so celebrated for the habitations they construct, but it is not less formidable. The finest trees, and even carpenters' work, are destroyed by them in a very short space of time. It is related on this subject, that an Intendant of the country not being able satisfactorily to account for a considerable deficiency of masts in the royal magazines, entered those which were missing as so many "*masts unfitted for service by the Termites.*" The Minister was not the dupe of this story; but he forgave the intendant, and contented himself with sending him a chest of files, an article he had not demanded, ordering him to file off the teeth of the *Termites*, as the government could no longer afford to make good the loss sustained by their depredations.

The heat is almost insupportable at the north-west port, where it is much greater than in the other parts of the island. I was forced on this account alone, to seek a more temperate climate in the centre of the country, and visited *Moka*, the *quartier militaire*, and the *Piton*.

Moku is a beautiful plain, situated between the *Pouce* and the *Grande Rivière*, which divides the *Plains of Willems*. When viewed from the summits of the neighbouring mountains, it presents a beautiful picture finely diversified by the different fruits and vegetables with which it abounds; here vegetation is extremely vigorous. From the gradual ascent of the land in this side, the mountains appear much less elevated than when viewed from the north-west port; the height of the *Pouce* from the centre of the Plain of *Moka*, is about two hundred and fifty toises; all its different ramifications in this direction, as well as the *Pouce* itself, terminate in pyramidal points. A road has been constructed, which, though steep, is sufficiently commodious, leading from the plain about half way up the mountain to the establishment formerly mentioned.

The Military Quarter is not yet fully settled, the greatest part of its surface is still covered with wood, and there is reason to believe it will long continue so, on account of the badness of the roads and its distance from the port. Since so much of the wood has been cut down, the rivers have sensibly diminished, particularly towards the northern part of the island, where water is become extremely scarce, and where almost all the rivulets are dried up. This inconvenience might be prevented by not wholly stripping the mountains of wood, and by henceforth leaving thick rows of trees along the banks of the rivers.

The apex of the *Piton* is elevated about a hundred and fifty toises above the woody platform which surrounds it; this rock is only accessible on one side, and after ascending it with some difficulty, other chains of mountains stretching at a great distance along the shore, every where limit the horizon to our view. This place is covered with large trees, the ancient branches of which continue to shade places which man has not yet rendered subservient to his industry; the language of love amongst the apes, the parrots, and some other solitary birds, indicate to the traveller that he has reached one of those spots which nature seems to have reserved as an asylum to those creatures, at the expence of which we increase our possessions.

The largest rivers in the island take their rise at the base of the central mountain, which is surrounded with marshes; the district of the *Trois-Ilots*, the marsh of *Bacois*, and that of *Citrons*, are extremely wet and turbid; several species of *Pandanus* and the *Menianthes Indica*, L. and other aquatic plants, are here found in abundance.

Ape-hunting afforded us much sport. These animals are killed with great difficulty, as they are extremely expert in concealing themselves amongst the branches of the trees where it is almost impossible to discover them. Their flesh is eaten by the Blacks after being broiled, but I never could prevail on myself to taste it, from the great resemblance which these animals bear to the human species; besides, the Creoles assured me that it is detestable.

The hedge-hog, *Erinaceus caudatus*, L. is very common in the forests in the Isle of France, but so far as I have been informed, they do not inhabit Bourbon. They are easily killed by a stroke with a stick. They live in holes in the earth and attain to a very considerable size; they are very unwieldy, and their flesh has some resemblance to that of the wild-boar.

We could not succeed in rousing a stag, although they are not uncommon in this country. It would appear that they inhabited the island when it was first discovered. I was anxious to examine one in order to ascertain the species to which they belong, as it

should seem they are different in many respects from ours; their legs being much shorter, whilst their bodies are very long, and their horns less beautiful than those of the stag in our climates.

During my excursion to *Piton*, I collected a great many curious plants, among which was the *Passiflora quadrangularis*, L. This plant ornaments in beautiful festoons the trees on the borders of the roads, and bears a fruit of a very agreeable taste.

It was my intention to have requested permission from General Magallon, to visit the Sechellés and Madagascar, when an English squadron, under the command of Commodore Elphinstone, appeared off the coast. Obligated for the present to relinquish my project, I offered my services to the general, which he was pleased to accept, and immediately attached me to his staff. After blockading the island for some months, the English commander, however, judged it proper to depart, and when on his absence the communication was re-established between the Isles of France and Bourbon, I obtained leave to visit the latter.

I made immediate preparations for my departure, although I had been for two months affected with a catarrhal complaint, which had even been accompanied with a spitting of blood. I flattered myself, however, that the air of Bourbon would prove more favourable to my health.

CHAP. VII.

ARRIVAL AT THE ISLAND OF BOURBON.—DESCRIPTION OF THE RIVER OF SAINT-DENIS.

10th August, 1803.

I EMBARKED on the 10th of August at 5 P. M. on board the *Petite Fani*, commanded by M. Houareau. Towards midnight, the wind from the north freshening, we were at day-light before *Saint-Suzanne*, from whence ranging along the coast we reached Saint-Denis, and anchored in the bay at 4 P. M.

As soon as we had anchored, the captain went ashore, in order to announce his arrival, and that he had passengers aboard; permission was soon after obtained for us to land. Here it is more difficult to get ashore than at Teneriffe; the road of Saint-Denis being much more open than that of Saint-Croix; and the Mole, which was constructed by the order of M. de la Bourdonnaie, having been carried away by the violence of the waves. As very few people since the revolution arrived at this island, the

inhabitants of Saint-Denis regarded us with much curiosity; and I was afterwards informed, that my epaulettes and large three-pointed hat had greatly attracted their attention.

We were, immediately on landing, conducted before the colonial committee, which holds its sittings in the old government house, situated opposite the mole; we were here received with great politeness, and after our papers had been examined, M. Lehoux de la Bernardière, a merchant on this island, enquired to whom I was recommended. I presented a letter which I had brought for him; after perusing it, he entreated me with the greatest frankness imaginable, to take up my abode at his house, adding that if I gave the preference to any other he would be much disobliged. I had often reason to rejoice at having accepted his polite offer, as it was impossible to have met with greater kindness and attention than I experienced from M. Lehoux. His wife was also very amiable; educated in France, she had only arrived a short time before, having left without regret a country, where, with a courage that at her age might be termed truly heroic, she had supported a train of misfortunes occasioned by the storms of the revolution.

Next day, I sent to Brigadier-General Jacob, governor of the island, the letters with which I had been entrusted for him.

Saint Denis, the principal establishment in Bourbon, is really not a city; it is termed *le quartier*, and is in fact a village, the streets of which, fenced with palisades, resemble the roads in the country: these streets being unpaved, and full of round pebbles, some of which have sharp points concealed under the herbage, are very dangerous to walk over, as the most trifling wounds in the lower extremities are frequently attended with the most serious consequences in warm climates.

The houses, which are in general constructed of wood, are extremely agreeable and well ventilated; they are usually ill-furnished, and the walls frequently remain altogether uncovered. This, however, is no proof of the poverty of the proprietor, as at Bourbon it is almost impossible to procure many of the elegancies or conveniences of life. All the objects of luxury are brought from the Isle of France, and which even there have been purchased at an enormous price.

The old government-house facing the port, the public magazine, and the church, are the only buildings worthy of attention. The town is divided into the high and low quarter: the first, which is inhabited by the opulent citizens, is the most extensive, and is built at the bottom of the mountains which are behind the city; the second is situated at the mouth of the river and intersected by a streamlet of water; the bed of the river is however formed in such a manner, that the superabundant water

flows in another direction: in this diversion there is only a single street occupied by people in easy circumstances.

The plants and vegetables common in the North-west Port, as well as several others, grow spontaneously in the streets of *St.-Denis*, and in the other parts of the island.

The air of *St.-Denis*, which is very pure, did not produce all that I expected; but I found myself at least much better than on my arrival. I was anxious to pay those visits which politeness required, in order to be at liberty to explore the environs of this place, when M. Montalent, with whom I had become acquainted at the house of M. Lehoux, proposed a party of pleasure to the habitation of M. Fabien.

His dwelling is situated upon the declivity of one of the mountains behind the town, and at the height of three hundred and fifty toises above the level of the sea. This respectable colonist received us in the most flattering manner. We partook of an elegant repast, under the shade of a verdant arbour, formed of the most beautiful foliage, and decorated with long rows of citron, orange, and other fruit trees, which produced the most pleasing effect.

The embellishments around the abode of M. Fabien, are in a style of great beauty and simplicity. A terrace before his house, commands a view of *St.-Denis* and the sea; to the left, Cape Bernard bounds the view; and the Mountain of *St.-Denis* lies beneath the habitation of our host: but to the right, the prospect is unlimited, and we behold the sea identified with the heavens, at the extremities of the horizon. The beautiful coast which we had seen in our way hither, now presented itself under a different point of view: we discovered in this smiling landscape, a part of the eastern embankment of the *Riviere des Pluies*. Availing himself of this commanding situation, M. Fabien has erected a signal-post, which can be distinguished at a considerable distance by vessels at sea.

In order to reach the spot where we now were, it was necessary to cross a small ravine behind *St.-Denis*, called *Ravine aux Noirs*: the ascent is in some parts extremely steep, and in others more gentle. We observed in our road, several spots planted with coffee, and various vegetables; and others wholly composed of calcined stones, or a red and compact earth. Our road lay along the edge of what is termed by the inhabitants, *Brûlé de St.-Denis*.

The whole Island of Bourbon is volcanic. This truth strikes even the least intelligent Creoles, who say to you—" *Le volcan a passé par ici: c'est un brûlé*," in order to designate a place that has been raised, or overturned by subterranean fire. The *Brûlé de St. Denis* is that part of the land which extends, with

a gentle slope, between the grounds of M. Fabien, and the river of *St. Denis*, from the town to the summit of the mountain of *St. Francois*, of which it forms the northern declivity: some part of its surface is well cultivated, and houses are built upon it; but in general, we only met with old currents of lava, incapable of supporting vegetation; or of which a part, decomposed by time and the action of the air, was reduced to a red earth, very much resembling argil. This kind of soil is unfit for the cultivation of coffee, although we have observed it flourish in places very similar in appearance.

The *Brûlé de Saint-Denis* is not so barren as its name would indicate, or as some similar places which we afterwards visited, since we observed upon it several patches of vegetation.

I visited, towards the end of August, the river of *St.-Denis*, which is well worthy of the greatest attention.

The rivers in this island are not like those in most other countries, which flow in a more or less uniform course through the vallies they embellish; but impetuous torrents, whose foaming waters, rolling from the summits of the lofty mountains down gorges which they have been forming for a succession of ages, fall into the sea. The banks of these rivers are frequently extremely steep, and broken into large fissures in various places; whilst in others, they have mouldered away: so that the traveller may recognize the effect either of subterranean fires, or of the more slow, but continual agency of rain-water.

The declivities of the mountains are every where furrowed with ravines of a greater or less depth, which branch out in so many directions, that, on traversing the island, in a line parallel with the horizon, we meet with precipices at every step. The sides of these ravines frequently form angles of 45 and 70 degrees. When viewed in front, they present a figure more acute than a V; and in the large rivers, they are frequently several hundred toises in height. As various circumstances are common to all the rivers in this island, we may form an idea of the rest, from a description of that of *St.-Denis*.

This river, which runs in a direction from south to north, is about two leagues and a half in length. It takes its rise at the western extremity of the Plains of Chicots, from the junction of two streamlets, and after flowing half a league farther, receives a third from the south-east. Mount *St. François*, which commences at the *Brûlé* of *St.-Denis*, and terminates in the Plains of Chicots, forms the western side of this river.

The junction of these branches forms a sort of point, named the *Citrons*; and three quarters of a league more towards the south, a ravine, called the *Bras de la Chaboupe*, enters the river, which, after this, receives no other streams in its course

towards the sea ; but the waters from the lateral summits, which are very abundant during rain, fall into it in an almost perpendicular direction. From the point where the river receives the *Bras de la Chaloupe*, we soon arrive at a magnificent cascade, which falls from a rock almost a hundred toises above the level of the bason below. The banks of the river are here so contracted, as to have the appearance of a circular wall, covered in several places with fern of an unusual figure, forming patches of verdure upon the dark and naked rocks. The sides of the fissure, through which the cascade is precipitated, are nearly perpendicular. It is impossible to conceive how delightful this solitude is rendered by the agitation of the waters, the noise of their fall, and the coolness which they communicate around.

The mountain, surrounded to the right by the *Bras de la Chaloupe*, and to the left by the river, is improperly termed *Pilet à Guillaume*. From this point to the sea, the banks become more interesting to the geologist, because the river being larger, and the sides more steep, and less clothed with vegetation, unveils more fully the internal structure of the volcanic mountains by which it is surrounded.

On ascending from the sea, towards the source of this river, we remarked—First, That all the salient angles exactly corresponded with the hollows in the opposite side ; or where this appeared not to be the case, it was evident, from the wrecks scattered about, that portions of the rock had either been broken off, or mouldered away : Secondly, The two sides were composed of similar lava. We recognized the same strata, and the same disposition of their surfaces ; they appeared only to have been interrupted.

At the entrance of the ravine, we distinguish some parts of the mountains, composed of pebbles, heaped together by the torrent, and agglutinated by the vegetable soil that the waters have not carried away. A little higher, the lateral heights, and the bed of the river, exhibit more of those protuberances.

Several basaltic currents and veins, differently disposed, are met with in this river, which we shall proceed to describe. The prisms of the first colonnade, of which the uppermost had suffered much more than that below it, are straight, or sometimes a little bent, and of a determinate thickness. They form a regular and very considerable series ; the largest having five sides, and being perpendicular to the horizon ; whereas the more slender are oblique. Wherever any of them have been broken, others are remarked behind them. The slope which is formed in front, by a great number of truncations, proves that many columns, which concealed those now exposed to

view, have been destroyed by time, and removed from their primitive positions.

On the right-hand side of the ravine, the waters have made greater havock, scarcely respecting the forms of the volcanic strata, which disruptions and cascades have nearly effaced. Yet a careful observer may trace the same disposition of things as on the opposite side, where the columnar basaltic strata are multiplied, and assume a great elevation.

In some places the prismatic range is uninterrupted, and takes the bent form of a sheet of water which is just about to be precipitated in a fall. We may explain this disposition, by recollecting the moment when the basaltic paste still retained a certain degree of fluidity, advancing with a tardy progress, and following the inequalities of the soil. The prisms, resulting from the cooling of the mass, have preserved, besides their appropriate form, that which was impressed on them by the flowing of the lava; and as several of the basaltic streams, incumbent on each other, which now occupy our attention, had found, each in its turn, the surface of the soil differently intersected, we may thence account for those basalts and prisms which occur in their respective positions of perpendicular, straight, oblique, curved, and even horizontal, over the whole of Bourbon; and the formation of which it is difficult to conceive, without adopting our explanation. It is now a generally received opinion, that such basaltic colonnades are formed by currents of lava; and the Geologist, who travels through the Island of Bourbon, may in some measure witness their formation. But besides these long series of pillars, there is found a substance altogether similar to that which enters into their composition, but which assumes a disposition so very different, that we were at first tempted to think that it was not the product of subterranean fire, and to regard it as real trap.

On a more attentive examination, however, I discovered this substance, to which I have given the name of *trappous lava*, to be a hard, compact stone, which possesses the same properties as basalt, which it greatly resembled, by being divided into prisms, blocks, or laminae—with this difference, that in these, the fractures are in a transverse direction to the veins; whilst in the others, they are perpendicular to the plain of the beds, in the vast mountains of which they constitute the basis.

We frequently discovered in both sides of the river, veins of this kind crossing in every direction the superincumbent beds of different lavas; they are inclined in a somewhat oblique direction towards the horizon, and almost always assume a zig-zag figure; they seldom exceed a foot and a half in thickness, and are never smaller than four inches; they are divided into an infinite num-

ber of transverse prisms, nearly parallel with the horizon. These prisms are often irregular and curved, and never exceed an inch or two in diameter.

When exposed to artificial fire, like basaltic lava, they separate into smaller prisms; which again subdivide into others still smaller, but always of the same form.

The horizontal beds of lava, which have been interrupted by the veins in question, almost immediately resume their natural order, and we perceive corresponding interruptions in both sides of the embankments, which have all the appearance of having been formed in the same manner, and at the same period.

These places afford less gratification to the lover of botany, than the mineralogist. The most interesting tree that we discovered, was the *Piper cubeba*, L. which is likewise prevalent in other parts of the island, and was one of the first productions which the Europeans noticed, on taking possession of this country.

In the woody places, near the cascades, we found different species of fern; and in the dry grounds, several specimens of the *Lycopodium nudum*, L. and *Polypodium phymatodes*, L. The waters abound with several plants, particularly *Jungermannia pinguis*, L.

The eminences which intersect the river *St.-Denis*, and decline towards the sea-shore, resemble a plain at their bottom. Their declivities are extremely gentle for more than a quarter of a league: they are in a great measure cultivated, and are not formed, as was supposed, from alluvial depositions, but are created by currents of lava.

CHAP. VIII.

EXCURSION TO THE PLAINS OF CHICOTS.

AFTER having acquired from the river *St.-Denis*, some idea of the other torrents in this island, and whilst I waited until the weather should become warmer before ascending the highest summits of the mountains, where the most severe cold frequently prevails, I projected an excursion to the *Plains of Chicots*. I hired a guide, who was well acquainted with these desert places, being a hunter by profession. This man's name was François Cochmard: he was intelligent, obliging, and faithful.

M. Jacob, the governor's son, another young man of *St.-Denis*, and M. De Jouvancourt, indicated a desire to accom-

pany me. The last, with whom I had formed the strictest friendship, attended me in all my other excursions; and by his amiable manners, rendered my fatigues much more supportable.

We took with us each a black, which made our company amount to nine in the whole, including our guide. From the badness of the roads, and the numerous precipices which lay in our route, it was utterly impracticable to travel on horseback; we naturally expected to endure many privations, and were obliged to reconcile ourselves to the idea of sleeping in the open air.

The detail of our preparations may appear too minute to a certain class of readers; but will be found useful by the naturalist, who may, in future, be inclined to traverse this unfrequented district.

In such excursions, the daily consumption of provisions is two pounds of maize for a black, and a pound and a half of rice for a white. We therefore provided ourselves with fifty pounds of each of those kinds of grain, with a little salt, some Jamaica rum for ourselves, and arrack for our attendants: we also carried with us a small quantity of ground coffee, and a little sugar.

A small pot constituted the whole of our kitchen utensils; we took also large cloaks and mats to serve for a bed, and I placed in a tin box, a ream of blotting paper, in order to prepare, as was my custom, the plants which I might collect during the first few days of our journey, as the specimens I found afterwards could, in general, be kept fresh in my botanical box until our return.

The whole of our baggage amounted to two hundred weight, so that each slave carried a load of fifty pounds; but they bore the fatigue of the first day, thanks to the arrack, extremely well, and at every meal, the weight of their burden diminished.

For my own part, I carried a water-proof knapsack, containing two pencils, some pens, with two penknives, scissors, a table-knife, a leathern goblet, a little elastic gum, a small box lined with cork, pins, small pincers, a microscope, with some sheets of Dutch paper, on which to make drawings, and a roll of writing paper, to contain my remarks and observations. I was afterwards convinced that I ought to have been provided with some portable apparatus for preparing my small plants, which were confounded with others in my botanical box, and could not be afterwards separated without difficulty.

We set out from *St.-Denis* on the 25th of August, at five in the morning, and ascended by a place called *Butor*, towards a ravine named *Premier Bras*. In this ravine is situated the *Chaudron*, by the side of the *Morne des Patates à Durant*,

both which merit a more particular examination than I was able to bestow.

The *Morne des Patates à Durant* resembles a truncated cone. We distinguished from it, the house of M. Fabien, as well as the streets of *St.-Denis*. According to my estimation, its summit cannot be less than seven hundred toises above the level of the sea. It is evidently the product of a volcano. The western part of its base forms one of the sides of the ravine, which bears the same name at its source; and which, with that of *Butor* and the other neighbouring torrents, have produced a deposition of earth, that we crossed on making the tour of the island.

The *Chaudron* is an immense cavity, resembling an inverted cone, the bottom of which is full of water, which falls into it, during the rainy season, from its highest side. Its sides, which are divided towards the summit, exhibit nothing but an uniform mass of reddish lava in those places, which, by their too great declivity, cannot support any kind of vegetation. The *Chaudron* resembles a vast crater of an extinguished volcano.

In proportion as we ascended, the declivities became more steep. We passed the habitation of Madame Berangerie about eight o'clock, and stopped at the coffee-house to breakfast. The thermometer stood at 10°. I had unfortunately broken my barometer, and, notwithstanding every exertion, could not procure another.

The houses in Bourbon are generally straight, high, and drawn to a point towards the top. That which we were in at present, was extremely pleasant: it was ornamented with date, orange, and other trees.

At the height of three hundred and fifty toises, we passed a small ale-house, kept by an old black. It was the last establishment we met with, and the ground above it remained uncleared.

After passing a place called the *Trois Jours*, which serves as a station for hunters, the forest became extremely thick, and the ground was covered with underwood.

The *Trois Jours* is situated behind the *Chaudron*, at the border of a small ravine, which enters the *Premier Bras*. It is for the most part dry, except in the cavities of the rocks that form its bed, which are generally filled with stagnant water. In these cavities, some of which are very deep, the runaway negroes light fires, when the water is sufficiently dried up. These grottoes are formed in the beds of compact lava, which here constitute the soil.

Until now the ascent had not been extremely rugged. The forests were full of curious trees, among which the palm Co-

rypha umbraculifera, L. was not the least interesting. It grows to a prodigious height. I have seen some of them even a hundred and fifty feet high, and none of them less than ten inches in diameter across the trunk, which is either very straight, or sinuous. It bears a bunch of palms upon its top, from whence proceeds a sprout, termed a cabbage, which is formed by the young leaves rolled up together: it is really a delicious viand; and is to me, the most agreeable of any of the productions of a warm climate. Its use is said to be productive of dysenteric complaints: for my own part, although I always ate them in the woods of Bourbon, I never experienced the smallest inconvenience.

In order to obtain this vegetable, the tree itself, which is very hard, especially when old, must be cut down. It constitutes the principal part of the subsistence of the runaway negroes, who frequently not having the means of felling the tree, or fearing that the noise of its fall might be a signal for pursuit, clamber up its smooth trunk, and with a very sharp knife, separate the head at the part where it is united to the stem.

This tree is extremely useful to the inhabitants of Bourbon: with the leaves they form coverings for their dwellings that are impenetrable by rain, whilst the wood is employed not only for water-pipes, but in constructing houses, magazines, &c. which, although displaying no external elegance, nevertheless possess much solidity, and are said to be very durable.

We stopped at the *Trois Jours*, to dine upon some birds we had killed on the road.* Here the weather was extremely fine: the thermometer stood at 16°. In about an hour and a half, we again set out on our journey: at every step, some new vegetable attracted my attention. About three o'clock, we discovered the first *Bambusa alpina*, which, in the strict sense of the word, may be termed an Alpine plant, as it is never found at a less height, above the level of the sea, than six hundred toises. It is, however, rarely discovered in regions exceeding eight hundred. This plant forms a very remarkable border all around the island, which is only interrupted by the burnt land, where the lava cannot support a vigorous vegetation. I regarded this border as a true temperate zone, which separates the inferior, or torrid, from the superior, or frigid zone. During a clear and sunny day, the thermometer stood in the shade at 16°.

About four o'clock, we arrived at a spot where we intended to pass the night in a little hut, which, we were informed by Cochinnard, had been constructed three or four years before.

At eight in the evening, we distinctly heard the discharge of

* *Turdus Borbonicus*, L.

two canons, that of St. Denis and that of St. Marie. The sound of the first had been conducted to us by the *Premier Bras*; and that of the second, by the *Riviere des Pluies*, on the banks of which we reposed. It is difficult to conceive to what a distance the sound of cannon, thunder, or even the discharge of a musket, is conducted along the course of a river during the night; or how often it is repeated and reflected from the surrounding rocks.

The temperature was cool, and the thermometer stood at 8 degrees; whilst in the vallies below, it was not less than 18 or 20 degrees at the same hour.

I estimated that we had reached the height of seven hundred toises. During the night, I was frequently awakened by the cold, although we kept up a constant fire, and I was well wrapped up in a large woollen cloak.

Next morning, the weather was moist and gloomy: at six o'clock in the morning, the thermometer stood at 9°.

We first of all prepared coffee, which is a necessary article of refreshment for those who sleep on the ground, who are shivering with cold, and who are debarred the luxury of a savoury meal. It is a common practice in the Island of Bourbon, to take three, four, or even five dishes of coffee in the course of the day. The poorest hunters, who pass a night in the woods, and who confine the rest of their portable equipage to so many rounds of powder and ball, a tobacco-pipe, and a steel, never dispense with coffee. They drink it either without sugar, which they term *bitter coffee*, or with honey, when they are so fortunate as to find it, and they then call it *black coffee*, a beverage which they prize far beyond all the strong liquors in the world. I, who am subject to frequent megrims, and who, notwithstanding my laborious marches, have scarcely ever experienced them during my residence in this island, ascribe my good fortune to my having adopted the same way of living as the Creoles, who are never troubled with them; and in defiance of all the traducers of coffee, I have taken it copiously, and several times a day.

At this place, the blacks prepared their rice and maize for the rest of the journey, which we recommenced at seven o'clock. The thermometer then stood at 10°. Cochinard informed us, that we must carry with us a stock of the palm-cabbage, as there were none to be found at a greater height. After half an hour's walk, we arrived at a somewhat rugged acclivity at the origin of a very elevated ridge, named *Entre-Deux*, which forms the *Premier Bras* to the right, and the *Bras of Montauban* to the left. This last ravine communicates with the *Riviere des Pluies*; the cape which it makes with it, is termed *Morne de Montauban*. It is elevated about eight hundred toises above

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the level of the sea ; and two hundred and fifty, or three hundred, above the bed of the *Riviere des Pluies* and the *Premier Bras*.

After passing this ridge, we re-entered a wood ; but at this height, owing to the greater coldness of the climate, and the scantiness of the soil, the trees did not attain the same magnitude as those on the plains, or the less elevated acclivities.

Here we observed the last calumets, which were very beautiful. The largest tree in this spot was an *acacia*, which Lamarck has described under the name of *Mimosa heterophylla*.

This plant presents a peculiarity, which appears an infraction of the laws of vegetation ; and which, at first sight, might induce one to conclude, that the genera, in which botanists include the different species, are arbitrary divisions, which Nature does not recognize, and within the limits of which she disdains to be confined.

Plants, however, are not detached beings. They belong to families and genera, constituted by different species, but which still have essential and marked relations to each other. Besides these essential relations, there are others of a subordinate nature, which may fail in one species, without separating that species from the family, or genus, to which it belongs by its essential relations.

But though these subaltern characters, which belong only to the physiognomy of the species, may not appear, it seldom happens that they are completely wanting. Thus, several *vetches*, which have no winged leaves, have a cirrhous, or tendril, accompanying a pair, or several pairs, of leaflets. This cirrhous serves as a prolongation of the common petiole, and seems as if it were intended by Nature to receive some leaflets. In the same manner, in the *Artocarpus jaca*, and in some species of figs, which exhibit no section in their leaves, and which appear, therefore, to be removed from their congeners, it is, for the most part, only necessary to examine the young shoots, to enable us to recognize the lobed leaves, which display the genus, and prove, if I may so express myself, the consanguinity of the plant.

The *Mimosa* form an extensive genus, which is capable of being divided into several genera, and of constituting a natural family. Almost all the known species of this genus have the leaves composed of winged leaflets, which are sometimes extremely numerous. The *Mimosa* of the forests of Bourbon, seems to abandon its genus by its form, as its leaves are quite entire, and have some resemblance to those of a willow. On examining these singular leaves, we were still more surprised to find them in a transverse direction, an irregularity which is the

more remarkable, as the leaves of all known vegetables grow horizontally.

The leaflets of the *Mimosa*, are articulated by their petiolules with the common petiole. Their articulations, the great flexibility of which is proved by the sensitive plant, are completely destroyed in desiccation. In the *Mimosa heterophylla*, the leaflets have existed, but owing to the extreme delicacy of the articulations, have fallen off successively. The common petiole only, has been able to sustain itself, and becomes enlarged in a transverse direction. The *Mimosa* of New Holland present the same singularity. When young, their leaves are conjugate, bi-jugous, or trijugous; but they soon fall off, like the petioles of the *Mimosa heterophylla*, which might, doubtless, with more propriety, be named *Mimosa aphylla*, to indicate its true character.

Hereafter, we shall frequently have occasion to remark, that the vegetables peculiar to these isles, present numerous anomalies; that, deviating from the species to which they naturally belong, they seem to have no determined forms; and that they are not as yet definitively included in families.

At noon, we arrived at the commencement of what is called the *Plaine des Chicots*, which is not strictly a plain, but the vast summit of a mountain, forming a platform. This platform has a gradual ascent, and its surface is interspersed with slight hollows, which sometimes resemble little vallies, and form hillocks, with very gentle acclivities. The thermometer was at 14° ; and I estimated our height above the level of the sea, to be 950 toises.

It began to rain, and the weather became very disagreeable. After walking for three quarters of an hour upon the plain, we took refuge in a cave, which commonly affords shelter to the hunters that frequent this platform. It is situated to the west, at a little distance from the Rain River, in a small ravine.

This sequestered grotto has been excavated by time. It occupies the side of a hollow, formed by the rains. It is surrounded by scattered rocks, which are shaded by some slender shrubs. Fresh water may be found here at all times, and when the rains give a supply to the ravine, a cascade falls exactly before the entrance to the grotto. In this wild and retired spot, we however, traced the hand of man; for even here several peach trees flourished which must probably have sprung up from the nuts scattered by hunters.

The thick mist concealed from our view a part of the plain which I had traversed: after dinner I attempted to visit the environs, but was obliged to desist from this purpose as the forests

were so much overflowed with water, that I was in danger of going astray.

This grotto is hollowed out in a bank, which appears to be composed of different small portions of lava agglutinated together by an eruption of mud, or which rain water, vegetation, and friction have collected, and united into a single mass. The roof and the sides of the cavern are very dissimilar; from the cement being destroyed in those parts in immediate contact with the atmosphere. It affords a safe retreat to the traveller, at least when the wind does not blow violently from the north, as it is well sheltered in all the other sides. Above this bank is another wholly composed of a current of greyish compact lava, with irregular fissures. It is very thick in several places; the water of the ravine which flows above the cavern, and along the surface of this bed of lava, becomes very small and insignificant at the place where it is precipitated, in the form of a cascade.

The weather was uniformly foggy and humid: at sunset the thermometer stood at 10° . After sunset, the weather cleared up, and in a short time became extremely delightful, and the night so clear, that we could distinguish at a distance towards the south west, the reddish lights of a volcano, which is more than eight leagues distant from the plain of *Chicots*.

Notwithstanding the great fires we kept up during the whole day, the cold was extremely disagreeable. Having risen about midnight, and again at four o'clock in order to examine the thermometer it stood at 4° the first time, and the second had fallen to 3° , at which it remained stationary until sun-rise; on plunging it into the stagnant water at our feet, it ascended to $6\frac{1}{2}$.

At day-break we set out to examine the environs; and in order to arrive at what our guide termed, the most beautiful view in the island, it was necessary to ascend still higher. In the open plain it was much colder than in our sheltered grotto; the surface of the ground was covered with hoar-frost which only melted on exposure to the sun's rays. The most singular appearance on the plain of the *Chicots* is a basaltic pavement of great extent, composed of polygons of different dimensions, the largest measuring about fifteen feet in diameter. Its surface is smooth, of a greyish colour, and full of small bubbles, which must have been formed whilst the lava was in a fluid state. These pavements are wholly destitute of vegetation, excepting a few *Polytrichums*, golden maiden-hair, and *Lichens*, Liver-wort, which grows in their different chinks and crevices.

After three quarters of an hour's walk we arrived at the summit of the plain, and the termination of our journey. I shall here confine myself to a simple description of the grand and magni-

scent prospect which opened to our view ; without endeavouring to convey to the reader the varied sensations which it produced on my mind.

I have already mentioned, that Bourbon, is composed of two volcanic mountains, one of which is still burning; and the other has been for some time extinguished; this last upon which we were is the longest; the *Gros Morne*, or *Morne Salazé* forming its most elevated point is nearly in the centre. Among the rivers which have their source in this mountain, four originate immediately in the *Gros Morne*, these are named *Saint Etienne*, *Galets*, *Mât*, and *Marsouins*.

At the point where we now were, the plain of the *Chicots* is abruptly terminated by a sharp rampart, covered with *ambavilles**, and broken in every part. Directly, below our feet was an abyss, the depth of which we shuddered to contemplate; and nearly opposite at more than two leagues distance we observed the *Morne of Salazé*, with its summit rent in various directions, presenting its steep and rapid sides. Between it and us lay the *Morne de Fourche*, which partly concealed from our view the *Bonnet pointu* with its fantastic crest. To the right, and at a great distance a perpendicular wall of red lava, and nearly of the same height as the *Morne* bounded the prospect. It forms one side of the *Brûlé de Saint Paul*, which circumscribes the basin of the *riviere des Galets* that we overlooked. This *Brûlé* is separated from the *Gros Morne* by a large chasm in which the wrecks of mountains are scattered about without order or regularity. To the left is the still larger basin of the *riviere Mat*. Its bottom full of ravines, and various protuberances, is surrounded by a rampart less terrible than the *Brûlé de Saint Paul*, but very much resembling it; another angular rampart is situated between the rivers *Mat*, and *Marsouins*; to the left the prospect is terminated by the volcano in the distance, crowned by a dome, always ejecting clouds of smoke which frequently envelop it even to its base.

The *Bonnet pointu*, also called *Cimandef* is very lofty and of a pyramidal form; nature in the formation of this mountain, seems as if she had wished to imitate the structure of the Egyptian pyramids; its height according to my estimation is about nine hundred and fifty toises above the level of the sea; it is supposed to be altogether inaccessible: its extensive sides are here and there covered with *ambavilles*; in other places they exhibit horizontal strata of reddish lava, similar to the angles of the

* Under this name the Creoles confound a great many plants, such as the different species of *Hubertia*, *Hypericum Penticosia*, &c. and we shall henceforth employ this term to designate such plants collectively taken.

During our excursion we observed several hillocks entirely composed of fragments of lava, and covered with *ambavilles*. I had a great inclination to climb them, with a view to ascertain whether there existed any craters at their summits, an opinion that did not seem to me improbable, for one of them was evidently truncated; but was deterred by our guide, who assured me that the enterprise would waste much time, and that in proceeding to the place where we intended to pass the night, we had still many difficulties to encounter. In the environs I found a beautiful fern, the leaves of which when bruised, diffused an odour like that of incense: I have since seen it in the herbarium of M. de Jussieu; he received this plant from Commerson, who has named it *Osmunda thurifraga*.

About eight o'clock we stopped at the termination of the plain, upon the brink of a ravine called the *Bras-du-Tour*, which enters the river of *Galets*. Here the thermometer in the shade stood at 9°, and when immersed in stagnant water out of the reach of the sun's rays, it fell to 7°. The soil was very unequal, and covered by tufts of gramineous plants. From the banks of the *Bras-du-Tour* we enjoyed a most extensive spectacle, which extended towards the bottom of the river of *Galets*; above the *Bras*, to the left, rose the summit of the plain of the *Chicots*; the *Bonnet pointu*, and the *Morne de Fourche* were seen by us under a new point of view: the vapours concealed from us the *Gros morne*, and straight before us appeared the *Brûlé* of *Saint-Paul*, at about the distance of a league and a half, constituting the most striking object in the picture, not only from its vast extent, but also from its aridity, and the red colour of the chasm at its apex, which is more than four hundred toises above the level of the basin which is formed by its base.

It was in descending through the forests that I first saw the tree, *Deforgia Borbonica*, which Commerson named in honour of M. Desforges, at that time Governor of Bourbon. The Creole hunters call it *baïs malegache*, which shows that it also grows in Madagascar; they attribute to it febrifuge virtues.

The road we had chosen became very much entangled by ferns; the beauty of the greatest number of them, however, made me overlook the inconvenience they occasioned. As the places through which our route lay were extremely damp, and much shaded with wood, I discovered a great many cryptogamous plants, among which was a *Jungermannia viticulosa*, L. in flower, and a *Lycopodium* which very much resembled our *Lycopodium clavatum*.

We halted a short time in order to shoot some blackbirds, of which we saw a prodigious number, when I heard a shrill whistle, that our guide informed me proceeded from a species of black

parrot, two of which we afterwards killed. The black parrot* frequents the most elevated and woody places; its bite is extremely severe; and its solitary and melancholy habits agree with its dark and black plumage.

We continued to skirt the river of *Galets*, which the mist now concealed from our view, when we descended a ravine, forming a sort of depression in the eminence upon which we stood, and pouring its waters on the one side into the river of *Galets*, and on the other towards the river of *Saint-Denis*: it forms the *Bras de la Rivière* which flows along the bottom of this mountain, which we mentioned in speaking of the grotto, and of which the *Piton de Grelle* appears to be the most elevated point.

Beneath the trunk of a decayed tree which was bent towards the declivity we were descending, we discovered the retreat of a Maroon, who had unquestionably died only a short time before. This unfortunate man had dug, with his hands, a hole in the earth, and the old tree formed the roof of this rude retreat; our people found an old knife, a broken kettle, several pieces of old iron, a few ropes, and the remains of some kids.

It was necessary to ascend the opposite side of the ravine in order to reach the *Piton de Grelle*, a name derived from that of an early hunter who first explored this eminence. Although the acclivities are extremely steep and rugged, yet as the *Piton* is clothed with wood, we found no difficulty in reaching its top by the aid of the branches and trunks of trees.

The *Piton de Grelle* appears to be the summit of that chain of mountains running between the rivers *Galets* and *Saint-Denis*. The deep ravines by which it is intersected run towards the west, and it is easy to perceive that declivity is the west side of the mountain of *Saint-François*, from which it has been separated by some earthquake that formed the fissure, at the bottom of which flows the river *Saint-Denis*.

This ridge is similar to that which unites the *Piton de Grelle* to the mountain which it terminates; it is almost perpendicular towards the river *Saint-Denis*, but somewhat less steep; on the opposite side it becomes at last expanded, and forms a sort of plat-form, named the plain of *Afouge*. This plain, like that of *Fougeres*, is covered with wood; and I discovered it to be very prolific of cryptogamous plants. Here the calumets grew to the height of thirty or forty feet, and the palm trees were extremely numerous and succulent.

The weather being mild and gloomy, the thermometer at one o'clock stood at 13°. About three we arrived at the spot where

* *Psittacus niger*, cauda elongata aequali, corpore cærulescente nigro, rostro orbitisque albidis. Gmel.

we intended to pass the night, and an hour after the thermometer had fallen to 11° .

The place where we now halted is named the *Camp du Bloc*. Formerly the plain of *Afouge* and its gloomy forests afforded a retreat to a great number of Maroons, who had erected upon the *Piton Grelle* a gibbet, on which they executed those blacks whom they judged worthy of death.

Several of the colonists entered into a league to extirpate them, and made the *Camp du Bloc* the place of their rendezvous; it was so called from a large block to which they chained the prisoners successively as they were taken.

Whilst we were at supper, there came on a gentle rain, which continued throughout the night. At two in the morning the thermometer was at 7° , but ascended to 10° soon after sun-rise.

Although in consequence of a breeze springing up there was every reason to suppose that the rain would soon abate, we did not wait, but resumed our journey. About eight o'clock the weather became fair, but we were very much incommoded by the water dripping from the trees, which were more numerous and lofty than in the high regions we had lately quitted.

About noon we began to descend into the bottom of a ravine, in order to reach the *Ilet à Guillaume*. In our progress thither, besides meeting with a great variety of curious plants, I discovered a beautiful species of *Angracum*. The whiteness, and the size of the flowers, as well as the agreeable perfume which it diffuses, render it one of the most interesting of this genus. I named it *Angracum eburneum*.

It was late before we reached the place where we intended to pass the night, but instead of meeting with a grotto, as we had been taught to expect, we only found a kind of excavation at the base of the *Ilet à Guillaume*, sheltered by some projecting rocks, and over-hanging trees. This retreat is situated in the *Bras de la Chaloupe*, and is much frequented by hunters.

The wildness and whole appearance of this place rendered it singularly attractive: rocks almost perpendicular, and upwards of three hundred toises in height, surround it on every side, whilst the bottom of the *Bras* does not exceed twenty paces in its transverse diameter; it is watered by a translucent and copious stream, which falls in cascades amongst rocks, piled above each other, and frequently of an immense size. Trees bending over the river afford delightful and umbrageous retreats along its banks, the beauty of which is greatly augmented by the ferns growing on them. The weather had cleared up, but in order to see the sky it was necessary to look directly above our heads; we could then distinguish that the palm and other trees, which grew on

the heights around us, and appeared very diminutive, were violently agitated by the fury of the winds, whilst the most perfect calm reigned below. During the whole day, the thermometer kept steadily at 15° or $15\frac{1}{2}$; and when plunged in the running stream, did not fall lower.

Towards evening the sky became overcast, and it rained during the greatest part of the night: our rest was frequently interrupted by the frightful noises, produced by detached fragments of rock falling from the sides of the ravine into the gulph below, and overwhelming every thing in their passage. The extreme terror of one of our companions did not tend to tranquillize our feelings: our alarm indeed was not wholly without reason, for accidents of the kind we dreaded, Cochard himself assured us, sometimes occurred; in consequence of the fall of stones, loosened by rainy weather.

We set out on the following day at ten o'clock, and I spent the whole morning botanizing in the environs; but I scarcely met with any thing that I had not previously discovered in the other places of the river *Saint-Denis*.

The thermometer stood at 16° , the weather was gloomy, and the atmosphere extremely moist, and in consequence of the late rainy weather, the ground had become so extremely slippery, and the trees so loaded with moisture, as to render our progress very slow and disagreeable: it was moreover necessary, on our leaving the *Het à Guillaume*, to climb the opposite mountain, which, on a cursory view, seemed almost impracticable. We descended at first about fifty paces into the *Bras*, leaping from one rock to another, after which we traversed the mountain in a diagonal direction. As it is almost perpendicular, those who went before were obliged to employ the greatest caution not to loosen the stones, which might otherwise have in falling wounded the persons behind. After a very fatiguing journey, during which we had many difficulties to surmount, we at last reached the summit of the mountain, quite exhausted. Jouvancourt, and my other two companions, who had not turned aside to herborize, arrived there much sooner than myself, who remained with Cochard and the negroes, in order to collect plants: but pursuing their way without a guide, they lost themselves, and became bewildered, so that they only came up with us on our entering the military district.

It was three o'clock in the afternoon when we arrived at the signal post on the mountain of *Saint-Denis*, dripping with rain, and shivering with cold. I here reposed myself a short time, before again proceeding on my journey.

It appeared to me singular, that the atmosphere of *St.-Denis*, and all along the coast, was clear and cloudless, whilst the

place, where we now were, which is about two hundred toises above the level of the sea, was, as well as all the neighbouring heights, obscured with thick fogs.

The river *Saint-Denis* having swelled much in consequence of the late rains, our friends had become very apprehensive respecting our safety, previously to our arrival. I set out on this expedition before I had perfectly recovered from the consequences of a catarrhal complaint caught during my stay in the isle of France. The fatigues and damps to which I had lately been exposed, brought on a relapse, and produced most violent pains in my chest, so that it was necessary for the present to renounce the plans I had in contemplation, in order that I might acquire by rest, and a proper regimen, new health and strength to undertake future excursions.

CHAP. IX.

EXCURSION FROM THE RIVER SAINT-DENIS TO THE RIVER MAT.

September 1802.

EARLY in September we prepared to make an excursion round the island. Jouvancourt indicated a wish to accompany me; we each took with us two blacks, and were again accompanied by Cochinard, who had acted as our guide in our journey to the plains of *Chicots*.

We departed at four in the afternoon, having left our people under the care of our guide, and slept at *Sainte-Marie*, which is situated about two leagues to the east of *Saint-Denis*.

The whole way to *Sainte-Marie* we travelled by a very good road along the coast and close to the sea-shore, upon a narrow tract of land, evidently formed by alluvial depositions, and about three-quarters of a league in its greatest length.

Soon after our departure we first reached the river *Butor*, formed by the junction of the small branches which run on the eastern side of the *Brûlé* of *Saint-Denis*. We next fell in with the river of *Citrons*, of which the *Patates à Durant*, which originates in the western extremity of the *Morne* of the same name, forms a branch, and, of which, we have already spoken.

The third ravine which we meet with, was the *Premier-Bras*, at the source of which we halted during our excursion to the plains of the *Chicots*: we soon after reached the *rivière des Pluies*, Rain river, which at present had only the appearance of a small stream, but must evidently, from the great rocks upon its borders, as well as the friction they have sustained, flow, when swelled by rain, with prodigious impetuosity.

Here the environs displayed a frightful sterility; there seems reason however to suppose that the cotton plant, *Gossypium herbaceum* L. of which we observed a few plantations, might perfectly succeed in this place.

On our leaving the ravines *de la Mare* and *Figuiers* we arrived at *Sainte-Marie*, a place extremely agreeable and delightful. It is composed of country houses somewhat distant from each other, and situated round a circular bay. A tranquil stream crosses *Sainte-Marie*, in a serpentine direction, which gives an air of freshness to the place, and contributes greatly to its beauty.

The river of *Sainte-Marie*, falls from the lowest part of the plain of *Fougères*, and derives its source from the base of a morne, which may be seen from a considerable distance at sea. The principal branch of the river of *Sainte Suzanne*, which gives its name to this eminence, flows into it on the opposite side.

A ravine called *Charpentier*, likewise crosses *Sainte-Marie*, from which place, to *Sainte Suzanne*, it is a full league. The intervening landscape is extremely delightful, the fields of grain, and of Maize, forcibly recalled to my mind the fertile plains in our southern departments. In our way to this last place we crossed a stone bridge, thrown over the river *Cheores*, the vicinity of which is very agreeable.

Sainte Suzanne is like *Sainte Marie*, composed of a few scattered houses, but the district in which it is situated is much more beautiful, on account of the greater richness of the soil, and a more vigorous vegetation. After crossing many inconsiderable ravines and streams, we at length reached the large river *Mat*, which is distant from the sea somewhat more than a league, and runs in a direction from west to east. A considerable tract of land situated between this river and that of *Sainte-Jean* is termed *Champ Borne*.

The *Champ Borne* is nearly level, having only a very insensible declivity towards the sea: it is richly cultivated, and not furrowed by a single ravine. On the opposite side of the river *Mat*, and stretching towards *Rock river*; there is likewise a considerable space of ground unbroken by any ravine, and very much resembling the *Champ-Borne*.

At the *Champ Borne* the great road divides into two branches; the left runs through the flat country towards the sea, that which we followed led us to the place where formerly stood the church of *Saint André*, which was laid in ruins by the *Sans-culottes* during the reign of terror at *Bourbon*.

We arrived, during dinner time, at the house of M. G. a colonist, who immediately on our being announced received us in the most polite manner. His plantations, which are in a flour-

fishing condition, produce Coffee, and Cloves. The principal staple of this district is grain, and on several parts of the adjoining heights they even cultivate rice, which flourishes very well, although from the nature of the ground it is wholly unsuceptible of irrigation.

I employed the morning of the 27th of September in visiting the environs of M. G's. habitation. During my stay at *Sainte André*, I likewise examined every thing worthy of attention in the river *Mat*:

This river, which is little more than five leagues in length, takes its rise to the south of the *Morne Salazé*, and runs in a direction from south-west to north-east. Its bed is similar to that of all the other rivers in the Island, and its banks are composed of divers volcanic strata exhibiting frequently true breccia formed of fragments of basaltic or other lava; these fragments retain the angles of their fractures; and are agglutinated into a solid mass without losing their characteristic forms. The ladies of M. G's. family having projected a fishing party on the river, they had the goodness to invite me to accompany them. We set out then on the 28th to a place named the *Gouvernement*, which is one of the most picturesque spots in the whole course of the river. After most excellent sport, we returned in the evening by the great road, and I perceived on the opposite bank, which however from the rapidity of the current I could not visit, a secret gorge formed by the sides of the torrent. At the bottom of this gorge there was a retired grotto, the entrance to which was by several narrow foot-paths adorned by a great variety of flowering shrubs. I learned that the spot had been thus embellished by M. *Dumorier*, whom I knew in the Isle of France, and who died only a few days after my arrival there. *Dumorier* had named this place *Julia's Grotto*, and had brought within its limited range almost every interesting plant which the island produces.

If a lover of the sciences, if a friend of virtue, should visit the island which I describe, let him pause in *Julia's grotto*; and, seated beneath the cool canopy and fragrant foliage of entwining shrubs, let him remember that the man, who cherished and decked this arbour, withdrew into its shade, when he reflected on the means of being useful to his equals, and of improving the condition of the surrounding colonists; and he never quitted his retreat without meditating the performance of some good action.

Amid the political storms which preceded at the birth of the revolution, *Dumorier*, esteemed by all parties for his moderation and his great virtues, was named with citizens *Boucher* and *Lescahier*, as civil commissioners for the French Government be-

yond the Cape of Good Hope. He performed his duties with that wisdom which characterized all his proceedings. At Bourbon he fixed his residence, and there married a lady highly respectable for the qualities of her heart, and of her understanding. While he prudently allowed the troubles of the revolution to ferment at a distance, he ceased not to cherish its principles, and to reprobate its enormities. Madame Dumorier scarcely survived her husband. On receiving the account of his death, her health rapidly declined: she resigned herself to grief, and refused all society, but that of a few of her husband's intimate friends, whose sorrows soothed her own. The amiable Madame Lehoux, who was very warmly attached to Madame Dumorier, had favoured me with an introduction to her friend: but after the violent emotions with which my contemplative visit to Julia's Grotto had inspired me, I felt that I could not behold the disconsolate lady, and I consigned my recommendation to the flames.

CHAPTER X.

DISTRICT OF SAINT BENOIT.—STAY AT M. HUBERT'S.

AFTER having arranged my mineralogical and botanical collections of the foregoing evening, we departed at nine o'clock for *Saint Benoit*. Scarcely had we crossed the river than we met with M. Ax. the elder. Having been informed that we were at the house of M. G. he came to invite us to his dwelling. Deeply penetrated with this act of politeness on the part of M. A., we accepted his invitation. He introduced us to his family, composed of his venerable father and mother, his amiable wife, two brothers and four charming sisters, who by the elegance and politeness of their manners, forcibly brought Paris to my recollection. We left this agreeable family after dinner, and arrived late in the evening, at the house of M. Hubert, where we were expected. M. Hubert, who has greatly contributed to improve the agriculture and prosperity of the Island, is universally beloved by all ranks throughout the colony. M. Hubert has furnished a proof of this by the homage which he has paid to the memory of M. Poivre, the late enlightened Intendant, of Bourbon.

Having received in 1798, the portrait of M. Poivre, our landlord celebrated a rustic festival in the garden of *Bras Musard*, in commemoration of his virtues. The details of this ceremony are truly interesting, for they paint the heart of him who arranged them.

The news of the festival affected Mr. Poivre's widow in the most sensible manner. One of her acquaintance read the particulars in a meeting of the academy of Lyons, and drew tears

from his audience. I have seen a letter on the subject, from Madam Poivre to M. Hubert; and the extracts which I am going to communicate, display that excellent lady's heart as well as that of M. Hubert, which she could perfectly appreciate by her own.

SIR,

I cannot describe to you the impressions which the account of your noble fate, of the 27th of March, last year, has produced on myself, my children, and every virtuous individual, who has perused it. I owe you, Sir, the most sincere acknowledgments. Nothing in the world can be more flattering to my feelings; and, at this moment, I want expressions to testify my gratitude and my sensibility.

"What a consolation it is to me, sir, to see the memory of the virtuous man to whom I was united, still living in the bosoms of the friends of virtue! It is the most precious reward of a life devoted to study, and to the performance of useful actions.

We have mingled our tears with your's, Sir, on reading the account of your generous proceeding to the good Jean Louis. You are the first French colonist who has given an example of emancipation, accompanied with the affecting spectacle which so well accords with the nature of such an act. Your conduct on this occasion is particularly calculated to inspire slaves with the love of labour, and masters with that tender commiseration which forms the happiness of him who exercises it, and of him who is its object.

When I received the relation of your fete, it had the power for a moment to suspend my melancholy. I could only think of your exalted mind, of the happiness of Jean Louis, of the pleasure of the guests, and of the consolation of having belonged to the worthy object of your grateful remembrance.

My children have participated with me in these feelings; they regard as their best inheritance the respect you have expressed for the memory of their father. Their delicate minds know well how to appreciate the virtuous and noble sentiments which presided at your festival.

It will give me pleasure to be informed that you have a family to imitate your benevolence, and perpetuate your virtues: your silence on this subject, however, makes me fear that this is not the case; but you must, Sir, have numerous friends and dependents, that will render you happy, and who must love you like their father.

I have the honour to be,

With the highest consideration, and gratitude,

SIR,

Your very humble Servant,

R. POIVRE.

LYONS,

22d Jan. 1792.

The worthy Jean Louis, M. Hubert informed me, died in 1795; and I have given his name to one of my finest plantations of cloves, which you yourself examined at the bottom of my garden.

R. P.

In order properly to appreciate the services performed to the colony by the deceased M. Poivre, it is only necessary to observe, that for a long time the Dutch East India Company had enriched themselves by monopolizing the spice trade; and that notwithstanding every attempt on the part of the English and French, it was not till 1770 and 1772 that the clove and nutmeg trees were introduced into these islands, by the indefatigable zeal and patriotic exertions of that respectable colonist.

On the 30th of September M. Hubert gave a dinner at his new habitation, which he has called the *Boudoir*. We here passed the whole day: the elder M. Grellan, an enlightened civilian, and M. Hubert Montfleury, the brother of our host, were of the party. Among the other guests was M. le Gentil, who afterwards accompanied me to the *Morne des Salazes*. The *Boudoir* is a very agreeable place, situated between Bourbier and the church belonging to the district. The house had been recently finished in a very simple and elegant style. One of the apartments was set aside by M. Hubert as a cabinet of natural history; but his mineralogical treasures were not yet properly arranged.

We visited the plantations around Boudoir, and saw there the bread-fruit tree, which was the object of his peculiar care, flourishing in great abundance. To this enlightened agriculturist the colony is likewise indebted for the introduction of an improved mode of management in the culture of the clove as well as the nutmeg tree; and for their more general diffusion throughout the island.

M. Hubert had promised that I should be experimentally convinced of the heat evolved during the process of fecundation by the spadices of a species of *Arum* very common in that part of the island. He had the complaisance not only to communicate to me all the experiments he had made on this subject, but to afford me an opportunity of verifying them at his house.

The *Arum* in question is a new species, which I have named *Arum cordifolium* *. It appears to be a native of Madagascar: and at Bourbon is called *Chou caraïbe*; but improperly, since that name is exclusively appropriated to the *Arum esculentum*, L.

* *Arum cordifolium* caulescens, rectum, foliis ovato-cordatis, subundulatis, basi emarginatis. N.

ST. VINCENT.]

I saw several plants of it in the Isle of France. Its flowers exhale a very strong odour; which, far from being disagreeable (like that of its kindred plants), is on the contrary rather pleasant.

The root of this plant is very thick, and penetrates deep into the soil. It produces a strong upright stem, four or five inches in diameter. The leaves are disposed in the form of a ridge; and fall off successively as they become old, leaving the mark of their petiole on the stem: they are cordate, oval, of a fine green colour, slightly undulated, very broad, and frequently a foot and a half in length; their nerves are pale and distinct, their petioles or foot-stalks are very long, round towards their upper extremity, very broad, and deeply furrowed at their insertion, where they are semi-amplexicaul, and transparent at their edges. The flowers, which are upright, and borne on short pedicles, issue from their bases. The spathe is greenish externally, and yellowish within, as well as the rest of the organs of fructification. The *Arum cordifolium* differs from the *Arboreum* (to which it has some resemblance) in the stem, which is thicker, and not so branchy as those of the reeds; in the colour of its leaves, which are not of so deep a green; in the form of its leaves, which are not sagittate, or arrow-shaped; in its spadix, which is not reticulated; and in the base of its spathe, which is not of a deep red.

It likewise differs from the *Arum sequinum*, L. by its larger dimensions; by the leaves, which are emarginate, or notched at the base, and do not resemble those of the cane; and, finally, because it is not furnished with what Jacquin calls the nectarium.

Madame Hubert, who is deprived of her sight by age, being seated near a spot where there was a great number of these plants, and having perceived their odour, enquired whence it arose; in consequence of which some of the spadices were brought to her, that she might form, by handling them, some idea of their shape. Greatly surprised at finding them very warm, she informed her son of this circumstance, who immediately satisfied himself of the fact. He has since made several experiments on the subject with different thermometers: these are so interesting, that I cannot avoid giving an account of the principal ones, and of the ideas which have suggested to me.

I shall permit M. Hubert to speak for himself.

“ Having observed that the flowers of the *Arum* yielded a stronger heat about sun-rise than at any other period, I tied five spadices which had been evolved during the night, round a thermometer. This number was necessary to cover the whole tube of the instrument. At sun-rise, the thermometer of comparison

stood at 19° ; it remained the same at six o'clock, while that of the experiment rose to 44° .

At eight o'clock in the morning, the thermometer of comparison was at 21° ; that of the experiment had fallen to 42° , and the heat of the spadices diminishing continually, at nine o'clock at night it was no more than 28° , while the first remained at 21° .

The next day, at nine in the morning, the thermometer of experiment followed the ordinary course. I made the same trials seven or eight times, with nearly the same results. The mercury rose to 45° , when I surrounded it with very fine spadices; it only reached 42° with the smallest.

I succeeded in disposing twelve flowers of the *Arum* round the thermometer, before the rising of the sun: the *maximum* of the heat was $49\frac{1}{2}^{\circ}$.

I divided five spadices longitudinally, and applied them against the thermometer in the direction of their section; the *maximum* of the heat was 42° . This experiment, several times repeated, having led me to suppose that the medulla or pith of the spadices also gave out heat, I contrived to obtain that of a spadix, after having cut it at two inches from its point, by means of a small tin tube, four lines in diameter, in order to plunge the elongated bulb of a thermometer into it. Twenty minutes after sunrise the mercury was at 39° , which was the *maximum* of the heat; the thermometer of comparison was at 17° . The heat of the mutilated spadix observed the same periods as that of the most healthy spadices; it began to diminish at seven o'clock in the morning, and finished in the following night. I repeated this experiment frequently; and, according to the size of the spadices, and the greater or less mutilation they had undergone in losing their medulla, I obtained 36, 37, or 38 degrees of heat.

The experiments above related were repeated alternately in a dry room, or under the shade of thick and humid trees, without the difference of the place occasioning any sensible variation in the results. I had only made my trials on the cut spadices: I determined to repeat them on the plant itself. Having placed my thermometer in a spathe, before sun-rise, I obtained 38 degrees, and sometimes only 36 or 37: the heat always ceased in the following night.

After having cut the extremities from six spadices, I tied the male parts alone round the thermometer. The *maximum* was but 41 degrees: the moment of this *maximum* was about half an hour after sun-rise. The heat continued much longer; for, the next morning about day-break, the thermometer stood at 30 degrees; and at nine o'clock at night it was at 24 degrees, when that of comparison was at 18 degrees only.

Six female parts of the flowers of the *Arum* raised the thermometer to 30° , frequently to only 28° . I took care to make the thermometer touch the *ovaria*; and to deprive them of that part of the spathe which incloses them, the upper part of which withers and falls off a few days after the heat has taken place.

Having reflected that the heat which I thought I observed in the medulla of the spadices, might only have arisen from their exterior surface, to convince myself I made the following experiments.

With a very sharp knife I removed all the surface of four spadices, without touching the medulla. I tied these four medullæ round a thermometer, which at sun-rise was at 17° . There was not any sign of heat during twenty-four hours: the uncovered spadices withered towards the middle of the day.

At the same time that I made the experiment with the medulla of the four spadices, I tied the surfaces of these spadices round the bulb of another thermometer. The heat raised the mercury to 39 degrees. I repeated the same thing several times; and convinced myself that the singular faculty which is the subject of this letter, is developed in the exterior surface of the spadices, and within the thickness of one line at most.

There is reason to believe that the heat indicated by the thermometer would have been greater, if the spadices could have been brought into contact with every part of the bulb or of the tube of the instrument. The following are some other experiments on the heat of the flowers of the *Arum*: the spathe, tied against the spadix during the fecundating process, withered as if it had been steeped in warm water.

Three spadices, when evolving heat, having been placed in a caper-bottle, it soon became dim; in half an hour its inner surface was covered with drops of water; in an hour more, there was an inch at the bottom of the bottle. I obtained a cubic inch of it in twenty-four hours. This water, which was without colour, and almost inodorous, dissolved soap very readily.

In the evening I cut five spadices, the spathes of which showed that they would open during the night; and after having fastened them round a thermometer, exactly as in my first experiment, I put their pedicles into water. At ten o'clock at night, the thermometer of experiment was one degree higher than that of comparison: the *maximum* of heat was 34° at sun rise, instead of 44° or 45° , which the spadices furnished when cut only an hour before sun-rise, and when these spathes had opened naturally. During the remainder of the day, the thermometer remained at 33° and 32° . On the following day, after

the usual hour of the *maximum* of the heat, the thermometer was still two degrees above that of comparison.

Flowers cut thirty hours before their development, opened slowly; their spathes separated one-half less from their spadices, and their heat did not raise the thermometer at the utmost above 25° . In general, the spadices which were mutilated some time before the development of their heat, gave out much less; and a colourless fluid escaped from the divided portions, which is not the case when the heat has been previously evolved. This state of the spadix occurs only once, and its heat generally continues twenty-four hours.

The following experiments were undertaken with the view of ascertaining whether it be possible to augment, diminish, or wholly suspend, the heat evolved by the flowers of the *Arum* during the process of fecundation. I imagined that these inquiries would not be wholly uninteresting to the philosophers who conceive that life is the mere result of the action of certain agents on our organization.

I covered with a cloth dipped in olive oil a fine spadix before sun-rise; but scarcely was the heat perceivable, when it again almost immediately disappeared, and at the usual hour of the *maximum* was not at all discernible: by suffering the covering to remain during the rest of the day, the thermometer of experiment and that of comparison followed a similar course. Tallow and grease produced the same effect. On plunging spadices, when at their highest temperature, into cold water, their heat quickly disappeared; but was again renewed on their being withdrawn in the space of twenty-five or thirty minutes.

By immersing spadices at their ordinary temperature into cold water before sun-rise, and allowing them to remain in it till noon, the heat was evolved, even in this situation, and raised the thermometer to 37° or 38° in half an hour.

After leaving the spadices twelve hours in water, at the end of that period they still raised the thermometer to 28° , and sometimes even to 30° , immediately on being withdrawn. In this experiment it is to be observed—1st, That if the spadices be immersed in the water after the hour of the *maximum* of the heat, their temperature will not be so high on being taken out.—2d, That if any of the extremities of the spadices be allowed to swim on the surface of the water, the supernatant portions do not experience any diminution of temperature, but on the contrary are of the same degree of heat as if the rest of the flower had been exposed to the open air. And lastly, that on the immersed portions of the spadices being withdrawn, and the suspended heat suffered to re-appear, the upper extremities, in which the heat

was evolved in the open air, did not yield more than the portions which had been kept under water.

Spadices kept twenty-four hours under water, did not raise the thermometer more than 2° or 3° above the temperature of the surrounding atmosphere.

Spadices immersed nine minutes in water previously heated to 41° , on being withdrawn raised the thermometer to 34° ; but they withered on immersion in water of a higher temperature.

I placed a thermometer for a quarter of an hour in the middle of a spadix immersed in spirits of wine. On being withdrawn the thermometer fell 4° below the temperature of the atmosphere; which in my opinion was attributable to the cold produced by evaporation, as in a short time it ascended from 35° to 39° . In this experiment the spirits of wine must be prevented from entering the upper part of the spadix, otherwise the medulla and external part of the flower will become dry in a short time.

I coated some spadices three times with essential oil of cloves; and afterwards placed three on one thermometer, and one on another. The first indicated 30° of heat, and the second 35° . The lower degree of heat in the first case most probably arose from the essential oil not being completely evaporated, and the concrete portion which remained producing a similar effect with the fat oil employed in a former experiment.

Spadices plunged for a short time into highly concentrated vinegar, recovered their heat on the evaporation of the fluid.

A spadix which had been five times wetted with vitriolic ether by means of a feather, raised the thermometer to 38° .

When covered with honey, the evolution of the heat was suspended in the spadices for about an hour.

Spadices deprived of heat by being wrapt up in several folds of a black or white stuff, indicated the same degree of heat, and at the same periods, as when uncovered.

Having tied up, as closely as possible, in a pig's bladder from which the air had been previously expelled, a thermometer surrounded by five spadices, it indicated only 30° ; but on being withdrawn from the bladder at eight o'clock in the morning, it almost immediately rose to 45° .

A spadix covered with starch prepared from the powder of the Manioc, gave out no heat till its covering dried and fell off in small portions.

Having formed of paper tubes of a size merely sufficient to contain a spadix in which a thermometer was previously placed, I closed them so as to prevent the air finding its way into them along the instrument. The heat was perceptible to the hand on

touching the external surface of the tube, and the thermometer indicated 37° .

Four spadices placed in a similar apparatus raised the thermometer to 43° .

In these last two experiments no water was produced as in the caper-flask; the paper tubes on examination were perfectly dry.— In another experiment I coated my tubes with very thick starch, renewing it every half-hour. The heat present in the spadices at sun-rise was destroyed; and the thermometers, during the whole day, continued to indicate the same degree as one exposed to the influence of the atmosphere. On withdrawing the spadices from the tubes to which they were luted, the heat was re-evolved. A difference in the colour of the tubes produced no difference in the results.

When only one coating of starch was employed, the heat of the spadices became perceptible on its drying.

A spadix introduced into a phial of Cologne water hermetically sealed, gave out no heat; in a pint bottle of the same water, on the contrary, the heat was very perceptible; arising probably from the greater quantity of air contained in the larger volume of water.

In carbonic acid gas in the air contained in the joints of the bamboo, and in the inflammable air of marshes, the spadices preserved their heat.

Having allowed several spadices to remain in a caper-flask well closed during five hours, a chicken which was introduced into it at the end of that time was immediately suffocated, but soon recovered on being quickly withdrawn. A taper was afterwards extinguished in the same bottle.

I shall not detail a variety of other experiments which are wholly unconnected with the temperature of the spadices of the *Arum cordifolium*; but only observe that it is greatly to be wished that the culture of this plant could be extended to Europe, and that some of our intelligent naturalists would employ themselves in examining the phenomenon which takes place during the process of its fecundation.

The *Arum cordifolium* continues in flower from May to February; but it is during the latter of these months that the flowers are most numerous, and attain the highest degree of beauty and perfection.

In 1777, M. Lamark observed that the spadices of what he terms *Arum Italicum** produced a very sensible degree of heat. "When," says he, "the expanded catkins of this shrub have ac-

* *Arum Italicum*, accaule, foliis hastato-sagittatis auriculatis, divaricatis, spadice cylindrico luteolo. Encyc. Met.

quired a certain state of development or of perfection, perhaps at the period when the process of fecundation is going forward, their temperature is so much increased as to convey when handled a sensation of burning heat, far above that of other bodies exposed to the atmosphere; this phenomenon, which I remarked ten years ago, I have since perfectly ascertained by repeated observations and experiments."

That the heat evolved by these catkins during the state we have already mentioned, is peculiar to them, and produced in their substance, is in my opinion fully evinced by the following circumstances. Of several catkins composing the tuft which I examined, only one or two at a time exhibited this increase of temperature; while the others remained of the same degree of heat as the surrounding atmosphere, till, in their turn attaining the necessary degree of perfection, they successively displayed the same remarkable phenomenon: this increased temperature continues only a few hours,

Repeated observations for several successive years invariably afforded the same results.—It is my intention to measure, by means of accurate thermometers, the degree of heat which is evolved in this part of the plant.

From the foregoing observations we are led to conclude, that plants are not really deprived of a peculiar heat during the whole course of their vegetation; but that this heat, which doubtless depends on their vital action, and which apparently acquires different degrees of intensity either in certain parts, or at particular periods of their growth, is probably so feeble in the greater number of vegetables as to elude our notice. It is besides probable, that many other plants would be found to display similar phenomena, at least in those parts destined to their reproduction, if they were examined with sufficient care and attention. Finally, we do not hesitate to believe that other species of *Arums*, as well as all the plants belonging to this family, are subject to this increase of temperature under similar circumstances, though in a degree more or less intense in proportion to the thickness of the catkins.

It appears truly astonishing, that among the learned men who since this period have written on vegetable physiology, the generation of plants, and the irritability of their sexual organs, not one of them has bestowed sufficient attention on this important discovery of M. de Lamark.

Such a circumstance however is certainly deserving of the most accurate investigation.

Perhaps this heat exists in the anthers of all plants; but being evolved only in proportion to their size, it may not be perceptible by our senses in the smaller vegetables. Should

future and more accurate experiments, however, confirm the truth of this conjecture, it may perhaps account for the peculiar motion of certain stamens, for the manner in which the eruption of the fecundating pollen is effected, and for several other phenomena, the causes of which we are still unacquainted with.

It has been already observed, that snow melts more rapidly on meadows than on roads or other ground destitute of vegetation. Now as gramineous plants are frequently in flower during winter, may not the more rapid liquefaction of the snow be explained from the heat evolved by the anthers of these plants? Besides, in their natural relations the grasses are sufficiently allied to the *Arum* to warrant me in forming such a supposition.

From the experiments of M. Hubert, it would seem that the mutilation of the spadices does not prevent the development of their heat; that this evolution of heat is carried on independently of the presence of light, but that the contact of atmospheric air is necessary to its production.

I should have been much surprized, if the spadices of other species of *Arum* had not been calorific. In order to ascertain this, I repeated several of M. Hubert's experiments on the *Arum esculentum*, L. in which he had scarcely discovered a perceptible degree of heat. In my experiment, on the contrary, a single flower, at the same hour, and under the same circumstances as the one he examined, raised the thermometer six degrees above the temperature of the surrounding atmosphere.

With respect to the time at which the heat of the spadices of the *Arum* is evolved, I conceive it must depend on the same circumstances as the expansion of the corols in vegetables which flower and lose their flowers at a particular and fixed period: it is not improbable that the blossoms of all plants expand in consequence of the heat of the stamens acting on the irritability of the petals.

While reflecting on the consequences which might result from the heat of the spadices of the *Arum*, I observed in the cool of a fine morning a great number of bees covering the male catkins of the *Pandanus utilis*, so as to exclude them wholly from the view. As these catkins are formed of a collection of stamens, I could not doubt that the bees frequented them with the twofold intention of collecting honey, while at the same time they were cherished by the heat of them. Too indolent however at the time to ascertain the truth of this conjecture, I returned on the following day to examine a thermometer I had placed on some catkins which had blown during the night; but I was disappointed in the results I expected, owing to the sun being too far above the horizon.

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In a short time, however, I convinced myself in another manner, that a sensible degree of heat is evolved not only in the anthers of the *Pandanus utilis*, but likewise in those of different species of canes. With this intention I cut some thin slices of a substance which readily liquefies, such as butter of cocoa ; and applied them along several stamens in such a manner, that on melting it sunk into the substance of those portions of the plant with which it was in contact*.

It were much to be wished that physiologists would pursue a course of experiments which promises such beneficial results, especially if conducted with the same care and discernment as those made by M. Hubert.

On our return I found a card from adjutant-general Galaup, to whom I had brought a letter of introduction from major Lavileon, requesting my company and that of Jouvancourt to his nuptials with one of the daughters of monsieur A.

We set out on the 2d for the house of monsieur A. in company with the bride and bridegroom, who had come to Saint Benoit to have the ceremony performed. General Jacob and his staff, M. Grellan, sen. and several other persons of the district, were present at the festival.

The civilities we received from monsieur A. as well as his new son-in-law, the affability of the ladies who were present on this occasion, and the general hilarity of the company, made us forget the volcano, and our projected excursion.

It would have been perhaps more to the taste of Jouvancourt, who is extremely gallant, to have paid his court to the beautiful females at his ease ; than to have traversed almost inaccessible mountains, where during half of the time the cold is almost insupportable. But he sacrificed this enjoyment to the pleasure he experienced in not deserting me : and as I could fully appreciate the value of the society he had relinquished on my account, I was at a loss to find words expressive of the gratitude I felt for this mark of his kindness.

The dwelling of monsieur A. is one of the most beautiful in the two islands ; by its wild and romantic situation, which he has improved to the greatest advantage. During our stay the plantations of coffee, which were then in flower, diffused a perfume like that of jamine. The palm-trees here and there, intermixed with the *Bombax pentandrum*, *Cycas circinalis*, L. &c. afforded a most delightful and refreshing shade. The garden, which is formed in a hollow of the mountain by which it is bounded on

* In the foregoing experiments, M. Hubert appears to have employed the centigrade thermometer. In order to reduce centigrade degrees to those of Fahrenheit, multiply by 9 and divide by five, and to the quotient add 32.

one side, and nearly surrounded by a running water on the others, and to which we enter by a long avenue of *Casuarina equisetifolia*, L. exhibits in its whole appearance something extremely romantic.

The abode of M. Galaup is not so richly ornamented; but standing upon more elevated ground, we enjoyed from it an almost unbounded prospect. I ascended to the signal-post, which is at no great distance; and from which I had a view of the whole country, from the *Piton-Rouge* to *Saint-Suzanne*. As this spot surmounts the *Champ Borne*, I was from that circumstance enabled to rectify some of my former observations.

It had now become necessary to tear ourselves from the hospitable mansion of M. Galaup: and we returned on the 10th to the house of M. Hubert; who, on account of indisposition, had not been present at the marriage, though a near relation of the bride. We had flattered ourselves with finding him better on our return, but had the mortification to observe that he still continued in the same feeble state.

CHAP. XI.

EXCURSION TO THE GREAT BASON, THE DRY RIVER, AND THE RIVER OF THE ROCKS.

11th October, 1802.

M. HUBERT, the son of M. Hubert Montfleury, having invited us to his house, offered to act as our guide in visiting the Great Bason; which in the island is called the Grand Etang, and lies at no great distance from his residence.

The road which we pursued leads through a plain, and is nearly equidistant from each side of the island. After travelling for about the space of a league we quitted the high road, and crossed the bed of a torrent known under the name of *Rivière Sèche*, or Dry River.

This river remains almost dry during a great part of the year: but, when full of water, rushes along with prodigious impetuosity; and its roaring may be heard at a very great distance, owing to its numerous cataracts, and the immense rocks over which it passes in its course.

We set out with the younger M. Hubert at a very early hour on the morning of the 11th of October. In order to reach the Great Bason, it is necessary to travel two-thirds of the way on horseback: and in this manner we were forced to proceed; for the road is so full of mud that the traveller, during the rainy season, sinks in it up to the knees at almost every step.

To reach the plain, M. Hubert (who, as I have already observed,

acted as our guide) made us repress the Dry River ; after climbing for some time its left bank above a dreadful precipice, called *La Marmite* by reason of its form. We skirted this precipice by a very narrow path on the declivity of the mountain, and among small trees and underwood so thickly set as to conceal the danger from our sight. I was assured that frequently animals, and even negroes, lose their lives by being precipitated from this tremendous precipice into the almost immeasurable abyss below.

Our way had hitherto proved extremely unpleasant. The weather moreover was wet and gloomy : and what tended to make our journey more uncomfortable was, that upon quitting the road, and pursuing our course along the channel of the torrent, the rocks were so slippery in consequence of the late rains, as to force us to take off our shoes, and proceed barefooted.

These rocks are evidently fragments of different kinds of lava ; among which we remarked immense blocks of a blue and somewhat blackish basalt, extremely hard, of a very fine and close grain, homogeneous in its texture, and of a smooth and shining surface. This lava, which abounds also in many other places, very much resembles touchstone.

I discovered no plants in the environs of the ravine but such as I had already often seen; except only a species of *Scirpus** which is generally found in the vicinity of volcanoes, but which here was far more beautiful and vigorous than I ever beheld it: the colonists call it *canne marone*, from the faint resemblance of its leaves to those of the sugar-cane.

As we advanced, the country became regularly more woody, and the soil more wet, so that we could scarcely distinguish the course it was necessary to pursue; when suddenly instead of the lofty woods through which we had lately travelled, we met with only shrubs and stunted trees; which in our opinion proved that we were nearly three hundred toises above the level of the sea. Ramparts almost perpendicular, and covered with verdure, surrounded us on every side; and formed an extensive circus, at the bottom of which lay an open and tranquil bason. From this situation we commanded an almost unbounded prospect; which perhaps we admired the more from its having opened on us very unexpectedly.

This water is not so pure as that of the small basons in the other rivers of Bourbon. It very much resembles the stagnant water which is met with in the heaths of Aquitaine. As the water of this bason has no outlet whatever, and is

* *Scirpus iridifolius*, foliis ensiformibus, distichis, substriatis, ramis panicularum basi vaginatis, spiculis ferrugineo atris, pedunculatis. N.

often completely dried up by evaporation during the droughts of summer, it would seem probable that it derives its origin and support from rains alone.

M. Hubert related to me, that having visited the *Great Bason* during a year in which there had scarcely fallen a drop of rain, he was very much surprized to observe something at its bottom of a dazzling whiteness, and resembling a flock of sheep flying before him. On a nearer approach, however, he soon discovered that this appearance proceeded from vast heaps of a moss, probably some *Conferva* which grows at the bottom of the lake when full of water. This moss had been so dried by the heat of the sun, that it was driven before the wind in the form of large flasks.—The depth of the lake or bason may be from thirty to forty feet; it is of a circular figure, and in diameter about the eighth part of a league. What surprised me very much was, the great paucity of aquatic and marshy plants on the margin of the bason, though the nature and situation of the place seemed to be singularly well adapted to their growth.

We observed neither eels nor fishes of any kind in the lake. A few swallows, which skimmed along the surface of the water, alone animated this dreary solitude, to which they were probably attracted by the numerous flies with which the place abounds. I discovered however swimming on its back, and with great agility, round an old log of wood, a very singular insect, of which I caught several. On examining it more attentively, I soon recognised it to be the pond lobster, *Cancer stagnalis* Gmel. so frequently met with in the pools near Paris.

Towards the bottom of the bason, the rampart (which is here more elevated than in other places) cannot be less than three hundred toises in height. On doubling a promontory towards the left, we came in sight of a part of the rampart already mentioned, which appeared singularly beautiful. During rainy weather, numerous cascades mingle their waters, and form at the base a rapid and impetuous torrent, which, instead of emptying itself into the bason, loses itself, and suddenly disappears about half-way.

Here it rains very frequently; and the atmosphere is for the most part loaded with vapours which either occupy the whole extent of the bason, or rest on the surrounding heights so as wholly to obscure the light of the sun.

As the rain which was at first gentle very soon began to fall in torrents, in our progress along the margin of the left bank of the lake, we took shelter in a commodious hut which had been constructed the preceding year by M. Hubert, in order to serve as a temporary retreat to such ladies as might visit the Great Bason.

After reposing ourselves for a short time, we again set out to

visit the *Grand Cascade*. On our way we frequently incurred considerable danger; for the rocks were exceedingly slippery, and the current was so impetuous as to prevent us from obtaining a firm footing. Several plants which I had not hitherto seen, compensated me sufficiently, in my estimation, for the various difficulties we had encountered in our excursion. Among others I found in the margin of the rivulet the *Hypoxis villosa*, and the *Lycopodium canaliculatum*, L. In the bed of the same rivulet I likewise found many small basaltic prisms, from one to three inches in diameter, and from six to eight long; most of them are four-sided, and have very sharp angles.

The rain becoming still heavier, we found it necessary to return to our retreat. My fellow travellers were of opinion that we ought to embrace the first fair moment to return home; but I was unwilling to depart without first taking a view of this singular place, and exactly determining its form and extent. I proposed therefore to remain, in expectation that the land breeze during the night would produce a favourable change in the weather; and that on the following morning we might view at our leisure all the parts of the bason at once, as I had only enjoyed this prospect for a single moment on our first approach to it. But my companions objected to this proposal, because we had been a great part of the day in the water, and had brought with us neither change of clothes, nor any covering for the night, which would most probably be extremely cold. Besides, M. Hubert assured me that the weather was absolutely set in for rain, which might continue for some days. I acquiesced in this opinion; and we immediately proceeded back to his habitation, by the opposite side of the lake to that we had traversed in the morning. We perceived to the left several plants of the *Arum esculentum*, L. which may prove extremely useful to travellers who follow the same route. The declivities along the base of which we proceeded, are more gentle and less elevated than those on the opposite side. We soon fell in with a narrow path frequented by hunters: this path leads to the river of Marsouins, which is at a small distance behind.

The rain had not abated when we left our retreat; but it greatly increased on our re-entering the forest, in order to resume the same route we had taken in the morning. It was moreover so extremely dark, that we could scarcely distinguish even objects at the smallest distance. We stumbled almost at every instant upon stones, or decayed logs of wood, lying in the mud.

When we arrived at the Dry River, the weather cleared up a little; but the rocks were so slippery, that the boldest of the Creoles durst not venture on them. At last, after encountering

much fatigue and danger, we came to the spot where our horses had been left in the morning.

It was completely dark when we mounted these poor animals, which were shivering with the extreme cold; and the rain continued to fall in torrents till we emerged from the forest.

Our horses sunk up to the belly in mud almost at every step; while branches of trees which the darkness of the night did not enable us to avoid, frequently threw us down, and struck against our faces.

During this fatiguing excursion, while wetted to the skin, and shivering with cold, I could not help representing to myself what kind of figure those geologists would have made in my situation, who, comfortably seated in their study, accustom themselves to judge of the structure of the universe and the productions of nature, solely from a few specimens before them; and who, considering as mere collectors such naturalists as have supplied the materials for their compilations, snatch from them both the honour and the fame they have so well earned by frequently exposing their health and life in the promotion of science.

On arriving at Marmite, we did not proceed by the narrow path which skirts the precipice; because my horse was blind on that side, and the ground was so slippery that I did not judge it prudent to expose myself to such a danger. We therefore pursued our course by a road leading through the plain, and found as we advanced that it gradually improved and became more dry. It was nine o'clock when we reached our host's house, where not a single drop of rain had fallen during the whole day.

All of us had suffered very much in this excursion, and I was not long in retiring to rest in order to recruit myself after my fatigue; but scarcely had I fallen asleep, when I was awakened by violent pains in my stomach and bowels, accompanied by a disposition to vomit. Jouvancourt experienced similar symptoms. Cochard and the negroes who accompanied us also suffered in the same way. We all endeavoured to explain the nature of this affection, but every one ascribed it to a different cause: for my own part, I am of opinion that it originated from the damp weather to which we had been exposed, and the fatigues we had lately undergone.

I took advantage of the opportunity which my stay at M. Hubert's afforded me, of again exploring the *Dry River*, more fully than I had hitherto done. Besides the masses of basalt formerly mentioned, we observed enormous blocks composed of a black hard and porous lava, intermixed with fragments of a reddish and spongy volcanic matter, which, from the effects of friction, had been reduced into pieces of a very small size, that readily struck fire with steel.

: Near this river is a current of basalt, which during some ancient eruption has manifestly flowed over a stratum of boulder stones; fast tending to decomposition and incorporated with an earth which, like that of the whole country, is comminuted lava. Both above and beneath the basaltic vein, runs a layer of pebbles of various sizes, being fragments of different currents, and all connected by earth. This curious alternation of compact and decomposed lava, is observed at only a hundred and fifty or two hundred toises above the level of the sea. The intervals then which have elapsed between the volcanic eruptions that produced the compact volcanic matter, must have afforded leisure for vegetation, and for the waters to form strata of a different description. This is the only inference which we mean at present to draw from the facts here stated; and we shall wait for more proofs before attempting to found a system.

M. Hubert had engaged us to proceed on the 14th October to the house of M. Patu de Rosemond, which is situated near Rock River.

M. Patu excels in drawing and painting, and shewed us a great variety of views which he had taken. They were all of them well executed; but that which I admired most in his collection, was a painting in oil, equally striking by the beauty of its colouring, and the savage wildness of the back ground. On the fore ground of the picture there were very happily grouped several persons, among whom, on viewing it attentively, I readily recognised M. Patu himself in the act of sketching the landscape, his charming son seated by his side, and endeavouring to imitate this employment, while in the distance were seen the worthy Doumorie admiring the situation, and Du Petit-Thouars examining by the aid of a microscope some plants which he had collected.—In the same picture there was also delineated the beautiful cataract of Rock River, of which I had received a most magnificent description. M. Patu undertook to conduct us to it after dinner. We accordingly set out, and proceeded along the left bank of the river. From the passage of the *Great Road* to the water-fall, the banks of the river gradually rise, and its bed progressively becomes deeper. Over against M. Patu's it exhibits a beautiful sheet of water; which brought to my recollection our own tranquil streams at their source, conveying freshness and beauty to the flowery banks by which they are confined.

A little higher up, near a beautiful islet covered with palm-trees, we could descend to the borders of the river, where we saw several negresses employed in washing; and on the opposite side a solid wall of lava appeared, extremely remarkable on account of the very regular basaltic prisms which it contains.

In the vicinity of this place, near a grove of coffee-trees sheltered by circumjacent mountains, I beheld for the first time a beautiful *Orchis* in flower, growing upon the decayed trunk of a tree; its corols, when agitated by the breeze, very much resembled a butterfly variegated with purple spots*.

We alighted not far from the waterfall, at the extremity of a plantation of clove-trees. Instead of pursuing the road, which leads to a bridge, we traversed a small thicket which borders the road towards the right; and soon reached the margin of the bason, into which we descended by means of the inequalities in its sides.

Here is situated the great cascade, respecting which M. Patu had not at all exaggerated; for the place, as he has truly remarked, displays scenery alike romantic and picturesque.

The river is at first inconsiderable, but it gradually enlarges from the accession of a number of streamlets. Its bed is full of small basons, into which the water successively falls in the form of little cascades. Where the river begins to expand, there is thrown over it a wooden bridge, beneath which a fall of water of no great height descends into a large bason: its waters are of the greatest purity, but appear dark from their depth, and from the reflection of the lateral rocks, covered with thick verdure. Close to the sides of the embankment are situated two dark and vaulted caverns, augmenting by their depth the extent of the bason, which may be about twenty-five paces in diameter, when the river is not full; for when it overflows every place is filled with its foaming waters, which rush forward with a degree of impetuosity almost irresistible.

It was from this spot that we viewed the magnificent prospect before us; but sublime as the scene appeared to us when seen in this direction, it must be still more so when contemplated from the bottom of the river! It is from the bason on the margin of which we now stood, that the great cascade proceeds; which is not less than sixty feet in height, and from six to ten feet wide. It rushes in an impetuous torrent into a great bason, whose sides are vaulted and cavernous, and the rocks over which it is precipitated are entirely basaltic.

Nothing can be more singular than the effect produced by the bridge. When viewed from the middle bason, it appears as if suspended over-against us; and to form with the sides of the ravine an irregular opening, through which was seen the torrent at a great distance towards the mountains, hemmed in on all sides by arid and rocky banks.

Between *Rock River* and *Saint Benoit*, is situated the pro-

* *Epidendrum Scriptum*. L.

montory of *Bourbier*, which only rises a little above the level of the sea; it is entirely composed of a thick basaltic stratum, of a grey colour, and extremely compact.

Upon the rocks composing this promontory, I did not observe a single species of *Fucus*; but I saw several shells. A small *Limpet**, and a beautiful *Echinus*†, sported in the midst of the agitated waters.

There is found on the shores of the Isles of France and Bourbon, a very curious little fish belonging to the genus *Blennius*. It lives chiefly among the reefs against which the sea breaks with the greatest fury. It is seen, on the retiring of the water, leaping in the spray, and climbing upon the rocks. It sometimes rises entirely out of the water, and remains in this situation for a quarter of an hour without appearing to sustain the least inconvenience; after which it suffers itself to be carried away by the waves, and re-commences its accustomed sport.

In this place I found numerous basaltic fragments, containing chrysolites of a pale yellow colour. The surface of the basaltic rocks forming this promontory had been so much changed by the action of the air and the marine acid, that I readily succeeded in detaching several pieces of the consistence of earth, and capable of supporting a vigorous vegetation. This conversion of lava into earth is a phenomenon which may be observed in many places throughout Bourbon; but is particularly remarkable in the vicinity of *Saint Benoit*.

M. Hubert informed me, that fragments of basalt containing sulphur are frequently found among pebbles near the mouth of the river Marsouins. He had the goodness to present me with some specimens of this kind; as well as a few pieces of a more brittle lava, with small plates of talc, and which contained particles of the same substance.

In this river, as well as in all the others I visited, I saw the *Patella Borbonica*, and a beautiful species of *Nerita*‡; the points which constitute its distinctive character, remaining soft and flexible during the whole life of the animal. These points appear to be composed of a horny pellicle covering the shell, of which they form a prolongation, situated over small apertures. This animal, which I observed frequently at my leisure, is of a yellow colour, thickly spotted with black; or rather black spotted with yellow.

* *Patella granularis*. L.

† *Echinus atratus*. L.

‡ *Nerita aculeata*? L.

 CHAP. XII.

FROM EAST RIVER TO THE DISTRICT OF SAINTE-ROSSE.

16th October, 1802.

M. PERIER des Bains, a relation of M. Hubert's, knowing that I wished to visit *East River*, near which he resided, offered to be my conductor; and for this purpose came himself to Saint Benoit, whence we set out on the 16th.

The road from *Saint-Benoit* to *East River* runs close along the sea-shore. We passed several ravines, which deserve to be noticed. The first is *Rivière Sèche*, Dry River, part of which we had already visited; its alluvial depositions have formed a point which bears the same name. I remarked that on this flat shore the pebbles are larger than elsewhere. Our road passed between this plain and a sort of promontory of the same kind as that of *Bourbier*, but which differs from it in this respect, that the waves do not dash against its base.

In proceeding to the little river of Saint Marguerite, we left to the right a precipice of between twenty and thirty feet high, which is a continuation of the promontory of Dry River. This precipice is composed of basalt, in which we could not trace the smallest vestige of the prismatic form; but perhaps the configuration of its surface may have been changed by the influence of rains, friction, and other causes.

In order to reach *Saint-Marguerite*, we crossed the ravine of *Saint-François*, which is composed of two branches. Shortly after we fell in with the river of *Saint-Pierre*, and at last reached that which is strictly termed the ravine *Seche*: here the road began to ascend, and ran along a platform or plain extending all the way to *East River*. I employed this and the following day in carefully examining the fissures in this plain; as well as the flat shore which lies before it, forming a little creek named *Mouillage des Orangers*.

In all the pebbles I broke, I observed the same species of lavas as at *Saint-Benoit*; but there is much difference between these productions, and the lavas which occur from *Saint-Denis* to the *Promontory of Bourbier*. These last assume a very distinct character; exhibiting neither *trap*, nor *felspar*, nor *zeolite*, but abundance of *chrysolite* of a glassy lustre and bright yellow colour. This *chrysolite* in some places obviously tinges the sand, which is composed of five-tenths of compact basaltic

lava, and four-tenths of chrysolite, one tenth of particles of puzzolana and other coloured lavas, and four-tenths of chrysolitic grains, which from their specific gravity uniformly rise to the surface.

M. Perier des Bains having procured a Creole, who was well acquainted with these places, to accompany us, we proceeded to examine the upper part of East River, the extensive embankment of which can be distinguished at a great distance. After passing through some plantations of coffee, we soon reached the right side of the torrent, which is extremely rapid. We descended by means of the shrubs and bushes; among which I observed a small *Lobelia** which seems to thrive on places lately volcanized, where no other plants are observed to flourish.

East River commences at the northern part of what is termed the *Plaine des Sables*, which here rises to at least a thousand and fifty toises above the level of the sea. After pursuing a very winding course for about three leagues from south-west to north-east, it empties itself into the ocean. It originates near a frightful precipice, surrounded on every side by declivities nearly perpendicular, and totally destitute of vegetation. It is extremely difficult to form an accurate estimate of its height, since we found it almost impossible to contemplate it without shuddering. The northern rampart of this precipice forms a continuation of another rampart extremely singular in its structure and disposition. It is here sufficient to observe, that after running for a certain length along the *Plaine des Sables*, it makes a sudden bend, and descends towards the sea, forming the western bank of the torrent under consideration.

From the rapidity of the torrent, the large fragments of rocks that impeded our progress at almost every step, and the slipperiness of the pebbles which prevented us from obtaining a firm footing, we found more difficulty, and greater danger, in exploring this river, than any of those we had formerly visited.

During calm weather, the thermometer stood at $20\frac{1}{2}^{\circ}$; but when plunged into the river, it fell in the course of a minute to somewhat below 15° .

As the places we now traversed are produced by volcanic explosions rather than by the agency of water, we encountered at every step large fractures and rents which we were obliged to climb and descend alternately, assisted by the tendrils of various plants: at other times the water of the river obstructed our course, and obliged us frequently to cross it; which we did with considerable difficulty, holding each other by the hands. In about three hours it began to rain so violently, that our guide advised us to return; at the same time assuring us, that in a

* *Lobelia polymorpha*, caule debili prostrato; foliis oblongis, ovatis, linearibusve, subdentatis dentatisve; pedunculis axillaribus longiusculis. N.

very short time the torrent would increase to such a degree that it would be impossible to re-cross it.

In conformity to his opinion, we began immediately to re-trace our steps; much dissatisfied with an excursion which had been attended with so much fatigue, without affording any thing particularly worthy of observation. We halted in order to light a fire, and partake of some refreshment, at the foot of the northern rampart, under the shelter of a kind of grotto formed in a bed of black and somewhat porous lava; on which we observed several trees, particularly that termed in the country the *black fig**. The bark of this tree is composed of very hard and smooth fibres: our guide and Cochinarde formed of it fishing lines, which, when soaked in water, are as strong as the best pack-thread of Europe.

At a short distance from the place where we rested, I observed a fine current of lava, the base of which is washed and somewhat destroyed by the waters. It appears to be formed of a very hard reddish basalt, the surface of which is very smooth, without prisms; and its substance is full of fragments of *chrysolite*, of a dove-colour in their fracture.

We left the river somewhat above the place whence we had descended into it in the morning. Here the embankment is more elevated, and at about a third of its height is a large and well cultivated platform. That part of the embankment superior to this plain is partly composed of pebbles, while the inferior part exhibits an unbroken and uniform current of lava.

We again set out on the morning of the 19th, with the intention of visiting what is termed the *Petite Brûlé de Sainte-Rose*, situated between *East River* and the parish-church. We reached East River about ten o'clock. I have already spoken of its embankments, its extent, and the nature of its bed. It must not however be imagined that the waters at any time completely fill this ravine: during their greatest increase there are always left some dry islets; notwithstanding which, the course of this river is frightful.

It is impossible to convey to the mind a more impressive picture than is here exhibited by great masses of rocks scattered without order or regularity, intermixed with depositions of sand almost destitute of vegetation; and among which, from the great declivities of the bed, the waters impetuously rush with a bellowing noise, presenting to the astonished sight only foaming waves unceasingly dashed against the numerous opposing bodies which they encounter in their course. The only plant we observed growing on the dry spots already mentioned, was the *Gnaphalium luteo-album*. L. Is this plant indigenous

* *Ficus Mauritiana* Encyc. Met.

to the country, or has it been brought thither by the Europeans?

After leaving East River, we found the road extremely good all the way to *Saint Rose*. In a short time we fell in with a current of lava, which it was my intention to examine. This current flowed from the mountain during the time of building the church of *Saint Suzanne*, in 1708. Its rough and scorious surface is already covered with *Lichen Vulcani*, a new species of grey rock-moss, which should be placed between the *Lichen paschalis*. L. and the *Lichen ramulosus* of Swartz. The other plants which characterize this stream of lava, and indicate its presence by a low and peculiarly coloured vegetation, are the *Scirpus iridifolius*, *Andromeda salicifolia*, *Celtis orientalis*, *Andropogon aureum*, a species of *Cinchona*, and a beautiful *Dicksonia*. From the date of this eruption, it is evident that vegetation may take place at no very distant period; but the precise term must always be regulated by accidental circumstances. The singular apertures observable in the substance of the lava, some of which are several inches in diameter, are formed by trunks of trees enveloped in the liquid mass. In other parts these fragments of trees have been so rapidly consumed, as to leave only the impression of their forms.

The rains which are extremely frequent in that part of the island included between the rivers *Mat* and *Rampart*, forced us during our visit to the *Brûlé* to take refuge in the house of M. Renaudie, where we remained some days in order to explore every thing worthy of notice in this district.

The Church of *Saint Rose*, surrounded by some small houses, and built of wood, is situated near the *Brûlé*. Here, the sea being more tranquil than on other parts of the coast, vessels may ride in perfect safety. This little bay or creek, by means of which the inhabitants carry on their commerce, is termed *Port Caron*, or *Quai la Rose*. Here I first began to form a just idea of the value of the natural productions to be found upon the shores of Bourbon. In several cavities of the rocks which are filled by the sea during high water, we discovered some very interesting marine productions.

We found here the *Eschinus esculentus*. L. of our shores in great abundance; as well as several Testacea, many of which are common to the Antilles.

In proceeding from the *Quai la Rose* to the place where we intended to stop, we crossed the *Rivière Glissante*, which empties itself into the sea by a considerable cascade. I found upon its banks the *Scævola Kanigü. Lam*; and a species of *Eugenia*, the foliage of which is extremely magnificent.

The sensitive plant, *Mimosa pudica*. L. which ornaments the borders of the road from *Saint Benoit*, is here so abundant as to prove exceedingly inconvenient.

The road which we now travelled ran through several well cultivated spots; though the soil appeared to have been almost as recently volcanized, as that of the *Brûlé* we had just left.

The habitation in which we at present took up our abode, had formerly belonged to the elder M. Grellan. Near the house he had cultivated a fine orchard; which, though now partly destroyed, still contained several interesting trees, among which I observed the *Ravenala Madagascariensis*. L. *Areca catechu*. L. &c. &c. Upon this last tree I found some beautiful specimens of *Auricularia*, which appeared to belong to that species described by Bulliard under the name of *Auricularia tremelloïdes*, and which is so common on all the old decayed trees in Europe; I likewise noticed two other species which I believe to be new.

M. la Renaudie derives a considerable revenue from the oil of the *Aleurites triloba*. L. This oil is drawn from a kind of nut. The tree which bears it is a native of Madagascar: our host has formed quincunxes of them before his house near the sea-shore, which afford a very agreeable shade. The *Aleurites* is very brittle; and grows with great rapidity, rising to the height of forty or fifty feet. Its form is elegant, and its leaves vary extremely in figure and size.

This district has but lately been settled. In proportion as we proceeded from *Saint Benoit*, and especially from *East River*, we found the inhabitants less intelligent. They still retained that peculiar expression of countenance which is observable in all uncivilized countries, and particularly in those where great physical revolutions have frequently occurred.

The first settlers at *Saint Rose*,—in consequence of being separated from the rest of the island by a torrent frequently impassable, of leading a wandering life in the forests which they gradually cleared and extended, of dwelling on the declivities of a frightful volcano, the very name of which is sufficient to make even the colonist tremble who lives at a distance from it,—have contracted a character conformable to their isolated and uncertain situation; and they have partly preserved even to this day, those savage manners which they only began to lose after the great road was formed, which opened a communication with the rest of the country. Since that period the settlement of some Europeans at *Saint Rose*, has still farther tended to meliorate the manners of the Creoles in this district.

At *Saint Rose*, particularly towards the *Brûlé*, and *Piton Rond*, the colonists are for the most part extremely poor, living

in wretched cabins, and almost never emerging from their forests. The soil however in this part of the island is suited to every kind of culture, especially that of coffee.

The *Piton Rond* though not exceeding forty toises in height, may yet be seen from the *River Mat*, as it is situated near the shore: it lies four leagues from *Saint Benoît* towards the south-east. The great road runs along its base; near which there is a small ravine wherein I discovered a beautiful species of mallow, *Hibiscus liliflorus*.

From the great road that we had hitherto pursued, the *Piton Rond* appeared of a hemispherical form. We ascended it by the western side, which is extremely well cultivated. At the apex, which is perfectly rounded, there is a signal-post, kept by a Mulattoe who was formerly a soldier. The situation of his hut is extremely agreeable, commanding a rich and extensive prospect.

From the *Piton Rond* we had a view of the most beautiful part of the district with the foaming billows dashing against its winding shores, and the sea blended with the sky in the distance; while the *Piton Rouge* which is only three quarters of a league distant, and the declivities upon which it is situated, concealed from our sight the *Pays Brûlé*.

At the foot of the *Piton Rond*, cultivated fields, small houses, rocky ledges, and a vast profusion of the *Pandanus montanus*, form altogether a scene extremely singular and picturesque.

Upon the declivity of a volcano opposite to us, we distinguished several hillocks which were elevated here and there in the form of cones more or less obtuse, and which we conjectured to be the ancient funnels of extinguished volcanoes.

The *Piton Rond* when examined on the side next the sea, is in reality very different from the appearance it assumes on being viewed from the great road. It is distant from the sea, which, we supposed washed its base, about two hundred paces, and is terminated by a solid wall of lava nearly perpendicular. Through the thick foliage with which it was shaded, we could perceive no trace of a prismatic configuration, nor even any considerable fissures.

From the point of *La Croix* to that of *Piton Rond*, rocks produced by currents of the same lavas form causeways, promontories, gulphs, and platforms united to the shore by means of natural bridges more or less elevated. In these lavatic remains time has hollowed out small cavernous basins, which preserve the water that flows into them during the influx of the tide. There are also several deep caverns; into which the waves rushing impetuously with a prodigious noise, are again thrown

back to the height of twenty-five or thirty feet, and descend again in the form of spray of a dazzling whiteness.

The shock of the waves in these caverns, from which the inclosed air endeavours to escape, produces large fissures in the moles or causeways. The water preserved in the small basons contributes by evaporation, and the crystalization of salt, to the decomposition of the rocks; thus by the action of the sea itself the form of its shores are every day changing.

Under one of these platforms at the bottom of a small gulph, there doubtless exists one of those subterranean excavations into which the water can only enter by means of a hole, as I have witnessed, and that in too small a quantity to fill it completely. We observed at a certain distance from the sea two small funnels, each having a hole at the bottom of from four to five inches in diameter: the most distant sends forth such a bellowing noise, that I was at first terrified on accidentally approaching it, till I learnt whence the sound proceeded; and the other, besides the air which it expels with great violence, ejects a certain portion of water, which, in consequence of its particles being separated by the action of the air, rises like a white smoke to the height of six or seven feet, very much resembling that proceeding from the crater of a volcano.

The aperture at which the water enters, exhibits another phenomenon. The air within the grotto, compressed by the force of the waves, and unable to find a sufficient vent by the two small funnels, expands and re-acts upon the entering waters; expelling them with the greatest violence, and in the form of a very thick snow, which mingles with the torrents that the contiguous rocks beat back in several different directions.

Can it be possible for either animals or vegetables to exist in such situations? I here however observed an animal of the genus *Blennius*, and a species of conferva remarkable for its beautiful green colour*.

I will not compare these diminutive eruptions with those of the volcanic mountains which surrounded us; but it must, I conceive, be admitted, that their effects bear a certain degree of resemblance to each other. Perhaps volcanoes themselves are only immense vaults, underneath which a sea of liquified matters exert on a grand scale the same fury as the ocean does beneath the rocks I have here described.

* *Conferva antennia*, filamentis simplicibus parallelis, inferne æqualibus, superne articulatis. N.

I found in the holes filled with water, an *Ulva** of a very singular form.

We caught a cuttle-fish, *Sepia octopus*, similar to one of those found on our shores, and which is here eaten by the Blacks; who regard this animal with a kind of terror, from an idea that they attack persons diving by grasping them close round the face and head with their arms and tentacula. I could not yield my assent to this belief; though a similar notion prevails in Provence, where the fishers relate the same thing concerning a fish in every respect similar to the one here mentioned.

It now only remained for us, before visiting the volcano, to take a view of the *Piton Rouge*, and what is termed by the islanders *les Cascades*. A colonist named M. Deschasseurs entertained us to take his house in our way, which is situated precisely at the entrance to those singular places. We arrived at this habitation on the 22d: and learned during dinner, with no small degree of pleasure, that for some days past a noise had been heard in the canton, which is usually considered as the precursor of an eruption; and that since that time the volcano exhibited a red flame, and had ejected a current of lava which pursued its course towards the coast.

In order to reach the house of Deschasseurs, we travelled along the great road, which is very good, till we came to the ravine of *Constantin*, so named from a Black who had been formerly killed near this place. The traces of volcanization became more evident at every step. The surface of the lava had retained even the smallest wrinkles; and the red-coloured rubbish of which the soil was composed, we should have supposed scarcely capable of supporting vegetation, had we not observed it clothed with a wild and luxuriant verdure.

After passing the *Ravine of La Croix*, we began to distinguish before us the great burnt land (*Grand Pays-Brûlé*); towards which we advanced, and which exhibited all the appearance of nature in ruins. Its square superficies is more than twelve millions three hundred thousand toises: its black colour, the majesty of its attitude, the dome of the volcano which terminates it to the right, the foaming ocean which bounds it to the left, the profound solitude which reigns around,—all present to the astonished traveller a spectacle truly awful and sublime. I watched with the greatest impatience the decline of day, in order to enjoy during the obscurity of night a view of these streams of fire, which I

* *Ulva reticulata*, fronde reticulata, ramis linearibus, planis, varie perforatis. Forsk.

was informed had escaped from the sides of the mountain, and of which I was anxious to form an accurate idea.

The *Piton Rouge* rises from seventy to eighty feet above the platform on which it is situated (termed *Montagne Rouge*, and which is thirty or forty toises above the level of the sea); taking its name, like the mountain it supports, from the colour of the lava of which it is composed.

After encountering various difficulties, we quitted the sea shore in order to explore our way to the summit of the *Piton Rouge*. When arrived at the top of this mountain, we enjoyed a most superb and solemn spectacle. Behind us, the calm sea and serene sky were blended in the distance. On our right rose the *Piton Rond*, exhibiting a truncated aspect towards the sea. Before us, a mountain reared its majestic head; and concealed from our view the sun, which still shone on the other side of the island. Over its dark and wooded ridge were scattered elevations resembling unequal waves. On the left lies the vast volcanic district; the dark and fuliginous aspect of which fills the mind with gloom. A huge dome of surprising regularity, surmounted by a prominent truncation, crowns and commands the prospect. This dome is the furnace of the volcano, or vent by which the subterranean fires seem to communicate with those of heaven. Its enormous sides are marked by shades of a more livid hue, and metallic tints. These are extinguished currents of a yellow, greyish, or bronze colour, which had forced a passage through the scorious crust of the volcano.

But when night had wrapped these silent abodes in the thickest shades of darkness, a new species of horror arrested our admiration. The crested summits, and the mass of mountains, were still depicted under a dark sky. The crater of the furnace emitted a column of blazing smoke; which was dissipated in the air, but coloured with fire some clouds which floated in the higher regions of the atmosphere. Amid distant and confused peaks, lightened by a sanguineous gleam, a burning current, the source of which was concealed from our view, slowly conveyed its glowing waves over a black soil, rendered still more dark and dismal by the glare of the liquid lava.

CHAP. XIII.

FIRST JOURNEY TO THE VOLCANO, AND ARRIVAL AT ITS CRATER.

24th October, 1802.

HAVING communicated to several persons my design of ascending to the volcano on the side towards the sea, I entreated M. Deschasseurs to procure me a guide: all my friends, however, joined in advising me from this rash enterprise as they termed it, at the same time assuring me that no one would be found willing to accompany me. "You will find," added they, "large chasms which it will be impossible to cross, heaps of cinders and ashes in which there is every risk of sinking, or you may at last meet death in some fiery torrent escaping from the sides of the mountain. On that side where the lava is usually ejected, cold rains besides frequently prevail; and hunters who have penetrated into those regions, have perished from the cold, or been suffocated by the sulphureous vapours."

I had wished very anxiously to visit this fiery mountain, and this desire was greatly increased on learning that no person had ever succeeded in the enterprise. I regarded as exaggerated the terrors with which they endeavoured to inspire me, and Jouvancourt partook of my sentiments; but the Blacks, discouraged by what they had heard from the slaves of the canton, displayed the greatest terror: they even proceeded to remonstrate; and, in order to induce us not to proceed to the crater by so unusual a road, one of them related several traditions which are prevalent in the country. They had, he said, learnt from many old natives of the island, that the volcano was the patrimony of the Evil Spirit; that it was the mouth of hell: that to white men it was peculiarly dangerous, since *they* never returned; the demons reducing them to slavery, and employing them to dig in the mountains, to direct the course of currents of lava, and to throw fuel on the fires, under the orders of negroes who were not more sparing of lashes than the whites are to their slaves. They even assured us that they had themselves at a distance off troops of whites employed in this manner.

These reasons produced no effect: I remained inflexible, and was very far from considering the road so perilous as they were inclined to represent it; besides, as Jouvancourt and myself were exposed to the same dangers, we conceived we had a right to order our people to proceed without reply. It was altogether different with respect to Cochinaré; he was solely master of his

own actions: in order, however, not to lose time in fruitless altercations, and to induce them to follow us, we declared that we had changed our design, and that we would confine ourselves during the present excursion to visit the *Pays-Brûlé* without ascending the volcano.

We departed from the house of M. Deschasseurs on the 24th.

From *Piton Rouge* to the *Pays Brûlé*, we found it necessary to cross the *Bois Blanc*, or *White Wood*.

The *Bois Blanc* is a part of the northern declivity of the volcano: this declivity begins at the spot whence East River derives its origin; it is still inhabited, and covered with majestic trees growing upon the currents of lava, which, except for this circumstance, we should scarcely have supposed congealed. The only plants we met with in the depths of this forest, and upon the aged palm-trees, were some ferns and several species of orchis, which perhaps require but a thin bed of vegetable mould for their support. Here the most common tree is that vulgarly called *white-wood*, and from which the canton derives its name: it attains to a great height, and is of a considerable diameter; its calyx is persistent and fleshy, of a campanulate form, and about an inch in diameter; its colour is then of a delicate carmine, and it diffuses an odour like that of apples. The tree under consideration belongs to the genus designated by botanists under the appellation of *Hernandia**: its leaves vary according to the age of the individuals; it is therefore necessary to have viewed it in different states, not to regard it as belonging to different species.

This forest is intersected by a ravine which divides it into two branches, extremely shallow at their mouth, and terminating at an embankment almost in the shape of a peak, which forms the continuation of that named the *Rampart du Bois Blanc*. On reaching the opposite verge of the forest, we beheld through the trees the vast *Pays-Brûlé*, which terminates a parallel rampart that lay exactly before us in the distance.

After descending about half-way the rampart of *Bois Blanc*, I discovered to the right a small aperture leading to an obscure and tortuous abyss, partly concealed from view by some withered and yellow branches. At the time I paid little attention to this opening; merely contenting myself with throwing into it a large stone, which I heard rebound several times from the sides of the precipice, but could not perceive strike the bottom. I have since learnt from several of the inhabitants, that during the great eruptions of the volcano there is exhaled from this opening a very sensible and frequently an inconvenient heat. To this circumstance, doubtless, must be attributed the withered state of

* *Hernandia ovigera*. L.

the vegetables surrounding it; at which I was a good deal surprised, though I did not at the time endeavour to conjecture the cause. This aperture is about twenty or twenty-five feet above the level of the sea.

At the bottom of the rampart lies the *Pays Brûlé*. The great ravine of *Bois Blanc*, or of the *Brûlé*, which is almost always dry, runs along the foot of this rampart, and parallel to its base: a wood which it intersects in its course extends about a quarter of a league into the *Pays-Brûlé*. The *Andropogon aureum*, *Dicksonia abrupta*, *Scævola Kaenigii* Lam. *Andromeda salicifolia* Smith, are most common in this place. I was much surprised to meet with here the *Mimosa Lebbec*. L.: these last trees must unquestionably have been brought hither by the first settlers.

Some unfortunate creoles who were unable to procure land elsewhere, had formerly resolved to settle in the woody part of the great ravine, a little above the tract which they term *The Road*. In the small limits inclosed by the ramparts of the *Bois Blanc* and *Tremblet*, these men had constructed their humble habitations, and cleared away the recent lava. The eruptions of the volcano, which yearly renewed their ravages, were not sufficiently considerable to force them to renounce their rash enterprise. But it is affirmed that the mountain, as if willing to punish this usurpation and give a lesson to the cupidity of man, in 1787 ejected a current of burning matter which flowed in a direct course towards the new establishments. This current was preceded by a flame which laid waste every thing in its progress, and the lava afterwards encrusted the wrecks which the fire had spared. Can it be believed, that after such a terrible example any individual would be found sufficiently bold to attempt forming a similar establishment? Yet it is certain, that when we visited this spot one of the colonists had a little before reached it with that intention; but as no one ever crosses the *Brûlé* but on the most urgent business, and then never penetrates into its interior, it has long continued to be a haunt for the Maroons, who occasionally sally forth and pillage every thing within their reach. The unfortunate cultivator of the *Pays Brûlé*, living in perpetual terror of these marauders and of the flames of the volcano, was at last compelled to abandon his pursuit.

After descending into the *Brûlé*, we halted in order to breakfast, and prepare ourselves for the fatigues of an uncertain journey. While the Blacks finished their meals I proceeded with Jouvancourt about a quarter of a league parallel to the sea, in order to take a view of the country; and discover, if possible, by the aid of a telescope, the most practicable course. The weather extremely delightful; not a single cloud obscured the atmosphere;

and I obtained a distinct view of the *Brûlé*, and of the volcano by which it is surmounted. At a little after eight the vapour began to collect; and, appearing to come from behind the dome of the mountain, partly concealed from our sight the wild beauties of the country we were about to explore.

This circumstance determined us first to ascend to a spot whence the great ravine of the *Bois Blanc* seemed to originate; and we purposed afterwards to climb an acclivity which did not appear, from the point where we now stood, to be wholly inaccessible, and from which it might be possible to reach the rampart of *Bois Blanc*.

We found the bed of the great ravine very abrupt, straight, and covered with several hollows which the water had worn out in the solid lava. As it was probable that the places into which we were about to penetrate would be wholly destitute of this necessary article, I recommended to our people to lay in a supply before leaving the great ravine.

In our road I met with several plants which I had not before seen; the principal of which were two fine species of *Pteris*. The fructification of the one * was of a silver colour; the other† was remarkable for the beauty of its leaves, and the arborescent nature of its trunk. A small *Polypodium* ‡ more particularly attracted my attention: it grew upon the large branches and twigs of some trees; its simple bifurcated or irregularly three-cleft leaves would appear to indicate that this vegetable had degenerated from its original form.

On reaching to the height of two hundred and fifty or three hundred toises above the level of the sea, I first met with a beautiful species of *Pteris* §, which is likewise prevalent in the rest of the *Brûlé*. This plant is the first that springs up on extinguished currents of lava; and is more or less vigorous in proportion to the coolness of its situation, or the age of the lava on which it vegetates. When in full vigour, its stem is five or six inches in diameter, and four feet in height. Its fronds, of a beautiful lively green, expand gracefully from the top, like the leaves of the palm tree; and are two or three feet long.

The great ravine of *Bois Blanc* originates at about a league

* *Pteris Cræsus*, frondibus pinnatis, pinnis infimis acutis biauritisque; tignibus argenteis. N.

† *Pteris marginata*, caule subarboreo, frondibus tripinnatis, pinnulis profunde pinnatifidis, acuminatis, serratis. N.

‡ *Polypodium multifidum*, frondibus lineari-lanceolato-acutis, simplicibus, bifidis, trifidisve. N.

§ *Pteris osmundoides*, caule arboreo, frondibus pinnatis, pinnis sterilibus, pinnulis ovato-oblongis, obtusis, floriferis, strictissimis, filiformibus, acutis. N.

distant from the sea, in a large hollow called *Trou Caron*. After reaching this place we were obliged to continue our route with a hatchet in our hands, in order to open a passage through the underwood towards the left. In a short time we reached a marshy spot of ground, where we discovered a deserted maroon camp, in which Cochinnard lighted a fire. After a most fatiguing and hazardous ascent, we too late discovered that the road we had chosen led to an impassable chasm; and, to increase our embarrassment, it was found impossible to descend by the same track. We therefore determined to proceed along the side of the embankment. In our way we caught hold of the shrubs, like so many apes; yet, notwithstanding every precaution, several of our negroes tumbled down with their loads, which it wasted much time to recover. We at length reached the acclivity that we had viewed in the morning from the sea shore, and the hopes we had conceived of its being accessible were not wholly disappointed. It was, however, very abrupt, and composed of small fragments of lava, which rendered our footing extremely insecure: its surface was overrun with a species of *Lichen*, which gave it an ash-coloured hue.

Before ascending to its top we distributed some arrack to our people, and promised two glasses more to him who should first reach the summit of the mountain; but they continued so extremely sluggish, notwithstanding this promise, that Cochinnard, Jouvancourt, and myself, reached it full three-quarters of an hour before the most active of these negroes.

We now found ourselves upon a very extensive platform, the limits of which a thick mist prevented us from fully discovering. We could only distinguish the *Piton de Crac* rising majestically on our left, and concealing its lofty summit in the clouds.

After all our negroes had arrived, we proceeded towards the *Piton de Crac*; which being woody, and covered with a great number of palm trees, would supply us with the means of constructing a camp. I besides hoped that at its base would be found some streams of water, as its angular summit is almost constantly surrounded with vapours; and I likewise observed some traces of cascades on its sides. I discovered, however, on a near inspection, that these cascades only appeared during great falls of rain; and that the water, percolating through the soil, disappeared on arriving at the base of the *Piton*.

These mountains being all volcanic, it was impossible to drive stakes into the earth; we therefore availed ourselves of some small trees growing near each other, in order to supply the place of pillars for our camp. Scarcely was it constructed before I began to prepare for my departure at day-break, in order to ascend the summit of the volcano. As the road ap-

peared to be extremely bad, I determined to carry only what was absolutely necessary, and to leave the most of our baggage in the camp under the care of the negroes; but what vexation did I experience on learning, that from the negligence of our attendants, notwithstanding my earnest recommendation, they had not provided a supply of water! I gave orders that an immediate search should be made for some in the neighbourhood of our present station.

In proportion as the day began to decline, the heavens assumed a more serene aspect, the clouds moved towards the sea, and the temperature was extremely mild and delightful. At sunset the thermometer stood at 13° , and every thing indicated the approach of a fine morning; how painful, therefore, would it have been to renounce the idea of a journey which promised such a happy termination! I perceived, however, the situation to which we were reduced: the negroes very soon returned from an unsuccessful search;—no spring existed in these volcanicized regions. I passed the night in the greatest anxiety; and Jouvancourt, who, in order to save our water, had refrained from drinking since our departure from the river of *Bois Blanc*, now began to suffer extreme thirst.

At three in the morning I left the camp in order to view the thermometer, which was suspended from a tree at a short distance; it stood at 11° . The most solemn silence reigned around. I continued to admire these solitary deserts, into which the footsteps of man had never penetrated; I thought that at a greater elevation I should discover still more subjects for wonder and contemplation. The negligence of Cochinard might prevent me from enjoying this gratification. I returned to the camp much enraged at his conduct: I even suspected him of some sinister design, for he had not displayed his usual zeal on the present occasion. The distressing thirst of my friend and fellow-traveller augmented my ill-humour. I waked our people, made them again light the fire, and immediately dispersed them in different directions in quest of water; at the same time informing them, that the want of this essential necessary would not alter my intentions, and that though some of us might perish with thirst I was determined to depart precisely at six o'clock for the crater.

Cochinard could not be found. What had become of him? I was expressing my fears to Jouvancourt, that he had abandoned us, when I heard him arrive, crying, *Drink, drink*. He held in his hand one of our calabashes full of water. Affected by the situation to which we were reduced, and with a view of repairing his neglect, he took advantage of the clear moon-light in order to search for water, which he at last found in the hollow of a rock. Though this water was of a very indifferent quality, it proved

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in our situation extremely acceptable; and we immediately dispatched our negroes to fill our empty calabashes.

I delayed our intended ascent to the crater till the following day, as the mists had already begun to collect upon the mountain; but our present station being one of the most singular in the whole island, I had no cause to regret this delay.

On this platform, which may be about three leagues in its greatest diameter, grew most of the plants which we had found scattered over all the different regions of the volcano, besides others common to different points of elevation. It was here that I first beheld a beautiful species of *Andromeda** in full blossom; as also the *Dracana flabelliformis*, which we had formerly observed growing on the trunks of old trees, or upon the sides of rocks: here it grew among the scorïæ, and upon a kind of burnt earth that possesses in a wonderful degree the faculty of absorbing and retaining moisture.

Besides a variety of other plants, the *Pteris osmundoides* grows in such abundance, that I have given to this platform the name of the *Plain of Osmondes*. It is like an enclosure contained within the rampart of the volcano: it opens towards the sea, where the mountain of *Sucurs* and the declivities of the *Pays-Brûlé*, terminate in a more or less abrupt manner. It was by the *Brûlé* that I proposed to descend on our return from the crater. I took advantage of our present leisure, to cause the negroes to form a practicable road at the commencement of the declivities by which we proposed to proceed. By cutting the branches, breaking the fragments of scorïæ, and filling up the principal holes, the way was rendered tolerable to the distance of a quarter of a league beyond a little ravine arising in the *Piton Crac*, and entering the great ravine of *Bois Blanc*. The labour bestowed on this road was not, as the blacks supposed, wholly useless: we found it extremely desirable on our return from the crater; when, exhausted by fatigue, it would have been almost impossible for us to make our way among the thick underwood, and over loose fragments of scorïæ profusely scattered in every direction.

From the most elevated part of our tract, we perceived the source of the *Bois Blanc* to our left before us lay the *Pays-Brûlé*; declining towards the sea; to the right we discerned the extremity of the *Rempart de Tremblet*, which terminates at the sea shore. *Table Point*, formed by the volcanic ejections, and which we afterwards visited, appeared at a great distance in the form of a light cloud.

The weather had been mild and gloomy during the whole evening. A land breeze, however, springing up, dispersed the

* *Andromeda buxifolia*. Smith.

vapours; and in about an hour and a half after sun-set, the sky assumed a pure and serene aspect: the thermometer fluctuated between $12\frac{1}{2}^{\circ}$, and 11° . Day now began to dawn; and we took advantage of the mild light it afforded, to pursue our way among these unexplored deserts.

Not expecting to find on this mountain wood enough to light a fire, we carried with us a quantity of boiled rice sufficient to subsist upon for two days; leaving the rest of our baggage in the camp, under the care of three Negroes whom we had brought with us from the house of M. Larenaudie. Those who accompanied us we only loaded with our cloaks, and a sufficient quantity of water. I took with me my own knapsack, with the necessary contents; but on the present occasion I, as well as Jouvancourt, had not sufficient foresight to carry an additional pair of shoes. Our intrepid hunter Cochinar (who, like the negroes, had perhaps all his life walked bare-footed) did not dream of providing shoes or stockings on this occasion: he had traversed the volcanic scorix on the mountains of *Sueurs*, and now defied the ruggedness of the regions nearer to the crater.

At ten o'clock no cloud had yet intercepted the dazzling brilliancy of the sun: but the plain of Osmondes already was covered with mist, exhibiting the appearance of a lake full of water; and the summit of *Piton Crac*, of a promontory which I named Jouvancourt, and of *Nez Coupé*, arose like so many islets in an ocean of vapours. These exhalations soon reached us, but quickly passed without even moistening our garments. We now began to experience much inconvenience from the excessive heat, and halted for a short time in order to enjoy some repose. Scarcely however had half an hour expired, before the thermometer indicated $12\frac{1}{2}^{\circ}$. Vegetation had now become extremely scanty; and the few plants that were still scattered over the soil, exhibited a very sickly appearance.

Some specimens of the *Polytrichum glabrum* grew upon the scorix, at the height of eleven hundred toises; and the *Lichen vulcani* flourished in still more elevated regions, and would perhaps have vegetated on the very summit of the mountain if the lavatic matters had been sufficiently decomposed to support it.

In a short time we again set out; but the sharp and rough fragments of scorix which we now met with, rendered it almost impossible to proceed: they rolled under our feet, bruising and lacerating them in a most dreadful manner by their asperities; our pantaloons were soon torn to pieces, and our limbs covered with blood.

Travelling in a region where a thick fog prevented us beholding any of the surrounding objects, we met with nothing to divert our attention from the pain we suffered. The lava over

which we passed was all of that species which is known in the island under the name of *Graton*, and by which appellation I shall hereafter frequently designate it.

We continued to proceed for more than an hour at a short distance from each other, almost uncertain what course we were pursuing. We soon began to experience an ardent thirst, which we were inclined at the time to attribute to the nature of our water, but which doubtless must have been merely the effect of our great and continued exertions. I shuddered to reflect that, before attaining our object, we must still, for three or four hours longer, combat with similar hardships; and that if we expended our water in the same proportion as we had hitherto done, it would be wholly exhausted before the termination of the day.

While indulging in such melancholy reflections, the mists were suddenly dissipated; and I could distinguish towards the right, at the distance of two hundred paces, a small mount in the form of a truncated cone. We called this first crater of the volcano *Piton de Faujas*, in honour of that celebrated geologist; who had so carefully explored similar volcanic mountains. Viewed from the *Piton Rouge*, it appears to rise between the *Nez Coupe* and the *Piton Crab*, but on more elevated ground; once before I had a view of the *Piton Faujas*, seven leagues out at sea, having the central crater to the north-west.

The *Piton Faujas* amply recompensed me for all my toils. It exhibits a complete volcano in miniature, with all its appendages. Time seems to have respected all its peculiarities, and to have presented its form entire. A truncated cone surmounted by its crater, a lateral vent on the side of the rampart, and a sunk hollow from which a considerable stream of lava issuing near the base proceeded towards the Osmundian plain, are still visible. This diminutive volcano manifests, in respect of form, situation, and supposed origin, a striking similarity to *Monte Nuova*.

The eruption of the 27th June, 1787, of which M. Hubert was himself an eye-witness, has left many visible traces of its progress. In the course of a week the current of lava reached the sea, distant at least three thousand nine hundred toises from its source; and the solid contents of ejected matter were calculated at eleven millions seven hundred thousand toises.

Here we surmounted the fogs which conceal from our view all the inferior regions. The dome of the volcano on which we stood, appeared as it were isolated in the air. We perceived around us only heaps of *gruton*, but somewhat higher we could discern several veins of a more or less brilliant yellow. We determined to reach them, in the hope that they would afford a

smoother road, and perhaps even conduct us to the crater whence they issued.

We now frequently observed a singular volcanic production dispersed among the scorise: it was in the form of balls, the largest of which did not exceed a foot in diameter, and which appeared to me very different from the volcanic balls hitherto described. Some of them are of the size of an egg; and they are all formed with an exterior crust, which is more or less than an inch thick according to the volume of the ball. This crust is sufficiently compact, and incloses porous lavas irregularly scorified with occasional cavities. The exterior surface of the crust is pretty uniform; but there are sometimes fissures filled up with a white solid stony substance that projects beyond it. The whole ball is usually surrounded by *graton*, which only adheres to it loosely. When it is the same lava loaded with chrysolites which has formed the *graton*, the compact layer in the inside includes for the most part moisture. It is common to find water in these cavities, though externally the lava appears altogether dry.

The fatigues of the ascent progressively increased; and the sun, which had hitherto been obscured by fogs, now burst forth in all its splendour, rendering the heat which was formerly oppressive now almost insupportable. Our poor negroes, exhausted by fatigue, who had hitherto followed us without a murmur, now weeping bitterly, represented to us that their mangled limbs could no longer support them: and entreated us to suffer them to remain on the spot where we now were, leaving them a little rice and water; and not to abandon them on our return, as the mist would render it impossible for them to retrace their way to the inhabited part of the island.

My domestic especially excited my compassion: and I had nearly acquiesced in their request, when Cochinard, better acquainted than myself with these heights, stated to me that frequently in an instant a thick fog would set in, and cover for several days this unknown region; and that if I agreed to the petition of the blacks, it would be nearly impossible for us to find them alive again. These unfortunate men, however, were unable to proceed farther; and we could not think of re-descending to the plain of *Osmondes*, since we had already accomplished the most laborious part of our journey, and could besides distinguish no points proper to direct our course. We likewise hoped to find a smoother soil and a little rest on arriving at the summit of the volcano, which could not be now distant more than an hour's walk. I proposed therefore to Jouvancourt that he should assist me in carrying the baggage, in order to relieve the negroes. I gave them at the same time some arrack, and allowed them to enjoy a short repose.

In about a quarter of an hour after, resuming our journey, we reached one of the veins we had distinguished from the *Piton de Faujas*. Its even and smooth surface afforded an excellent road; and our negroes, resuming their courage from this circumstance, insisted on relieving us from the baggage. These currents near the summit appear to have been arrested in an early stage of their descent; and their surfaces, in cooling, have assumed the most varied and whimsical forms. In fact, from the manner in which we paint a dragon, I am tempted to believe that it is no more than an allegorical representation: of which the form is derived from these extraordinary contortions of lava; and the power, the wide throat, the flaming and sulphureous breath, and the dismal groanings, from the stupendous phenomena of volcanoes.

All our globe is covered with traces of volcanic revolutions; and history has every where preserved the remembrance of the most dreadful of volcanic earthquakes, which has blotted from the face of nature a country as large as Asia and Africa, if any credit be due to the narratives of the Egyptians. A great image was necessary to express this tremendous power: hence the idea was conceived of a fire-vomiting animal, as swift as the lightning, and more terrible than the thunder. This ingenious emblem is to be found among all ancient people; the Chinese and Indians, the Egyptians, Greeks, and Peruvians.

But I forget that I am more than twelve hundred toises above the level of the sea, that the currents whose fantastic forms I have noticed now terminate, and that we again encounter rugged and broken fragments of lava. We had not proceeded far when some hollow noises broke upon our ear: they were first perceived by Jouvancourt, who was somewhat before me; and almost immediately afterwards we were assailed by a strong sulphureous smell. We now reached a kind of platform, on which arose a conical crater, that we instantly recognized to be the same we had distinguished from the house of M. Deschasteurs.

At one o'clock, the thermometer exposed to a brilliant, stood at $20\frac{1}{2}^{\circ}$, and even ascended to 21° ; the weather was perfectly calm.

 CHAP. XIV.

DESCRIPTION OF THE SUMMIT OF THE VOLCANO.

THE crater at the base of which we had arrived with so much fatigue and difficulty, is about a hundred and sixty feet high. It did not appear to be truncated; and its sides are extremely abrupt, often making with the horizon an angle of 80° . They are composed of small currents of vitrified scorix; spongy, light, extremely brittle, and their external surface brown. The cellular partition, which we observed in these scorix, either reflect a metallic lustre, or are of a brilliant red. This volcanic substance crumbles between the fingers, and can easily be reduced to a shining powder.

From the *Piton* we perceived to the right and left some parts of the limb of two immense craters, which induced us to name the one under consideration the *central crater*.

The axis of this crater is nearly perpendicular; and it is furnished at its summit with a round aperture, forty toises in diameter, and about eighty feet deep. The bottom of this crater was filled with wrecks of lavatic matters; and its sides appeared to be formed of different lavas, hard, grey, compact, and porous.

Through some interstices in the lava, issued slight vapours which left traces of a sublimed sulphur on the places exposed to their action.

Jouvancourt, who had proceeded towards the right, suddenly stopped, as if thunderstruck; and from the inarticulate cries he uttered, I conjectured he had witnessed some phenomenon sufficiently extraordinary to deprive him of the power of speech. The negroes who surrounded him, likewise appeared as if suddenly petrified. I advanced, and at the sight of a spectacle so truly astonishing was myself rooted to the spot without the power of giving a reason for what I experienced; when all at once two columns of ignited matter red-hot in the midst of sunshine, darted to the height of twenty toises. Fragments of rock still unfused, and dragged along with the fiery tide, were projected from it with violence; and fell with a hideous crash, after having described a long parabola: while a rushing noise like that of an immense cascade accompanied the majestic scene, overwhelming the soul with wonder and admiration.

Having some time before heard of the death of the justly celebrated Dolomieu, I bestowed his name upon the crater and

der consideration. It was not till half an hour had elapsed, that we thought of descending in order to seek upon the platform a current of solid lava on which we could repose after our fatigues. We soon discovered the object of our search; and being unable at present to pursue our examination into the objects around us, we determined to rest in our present station during the night.

In proportion as the evening advanced, the weather became more mild, and the clouds were partially dispersed by the setting in of the land breeze. Our horizon was still, however, limited; and we could not, with all our anxiety, discover the environs of the volcano.

At sunset the thermometer indicated 110, and fell towards midnight as low as 6°. Notwithstanding the hardness of our bed, and the light and noise which, issuing from the volcano, produced the most terrible effect during the darkness of midnight, we all slept extremely sound, doubtless in consequence of the great exertions we had made on the preceding day. I did not even awake, notwithstanding the extreme cold, to mark at day-break, as was my custom, the degree of heat indicated by the thermometer.

When we awoke, the inferior regions were still enveloped in thick clouds; but through some of the interstices produced by currents of air, I could now distinguish objects at a great distance around.

When ascending the *Pays Brûlé*, and traversing the rampart of *Bois Blanc*, we had perceived it opposite to that of *Tremblet*, with which it is nearly parallel; and which, receding from the sea-shore, extends from east to west for about the space of three thousand toises. These opposite ramparts, which seem so distinct, are only a continuation of each other: their extremity being bent into the figure of a semicircle; and confounded, behind the dome of the mountain, with what is termed the *Rempart de l'enclos du volcan*, "rampart of the inclosure of the volcano."

We afterwards visited the outside of this inclosure, to which we descended by the aid of some solitary shrubs that had sprung up on those parts of the declivity where the lava was decomposed. At the bottom of the rampart we reached a space sufficiently plain and smooth to deserve the name of the *platform*, and which lies close to the base of the dome upon which we now were.

The central crater, which appeared, from the side by which we reached it, to be the most elevated part of the mountain, is in fact only on a level with a vast crater which we visited in the morning, and which then threw out neither lava nor smoke.

Jouvancourt, who arrived at it first, bestowed my name upon this volcanic aperture.

During the eruption of 1787, which we have already mentioned, the lavas were emitted from the crater Bory. Seven or eight years ago, this crater still continued to throw out clouds of smoke; and I have been assured since my departure from Bourbon that it has again opened, and ejected a torrent of liquid matter. There was only a single opening at the summit of the volcano till 1766, when the central crater burst forth from the side of the mountain: at that time it assumed the form of a truncated cone, but has since become considerably elongated. The central crater, at first extremely insignificant, has been raised in a very short time to its present height. We made the tour of this crater, in order to approach as near as possible to its modern mouth. Observing that the fragments of rocks ejected from it rarely fell beyond its sides, I had formed the project of sleeping upon its brink, in order to enjoy during the night a view which I conceived would be extremely magnificent.

Early in June 1791, an eruption occurred from this crater. The lava, after being precipitated from the dome, skirted the base of the rampart of *Tremblet* in the *Grand Pays Brûlé*, and arrived at the sea on the 13th of July.

Early on the 4th of the same month, a slight shock of an earthquake had been felt in those parts of the island most distant from the volcano, though it was not perceived either at *Saint Rose* or at *Saint Joseph*. On the 17th an extraordinary noise was heard over all the country, similar to that produced by the discharge of a cannon; and there arose almost immediately from the summit of the mountain a vertical column of thick black smoke, interspersed with whitish spots. The sun assumed a bloody aspect, and the sky in a short time became obscured by reddish vapours. Never had such a tremendous event been witnessed by the astonished inhabitants, who remained in a state of the greatest consternation. It is from this period that we must date the origin of the crater Dolomieu, and the noise of which we have spoken was most probably occasioned by the explosion that preceded its formation.

M. Berth, an intelligent officer, visited this new aperture on the 29th, twelve days after its production. It was of a roundish form, about a hundred toises in diameter, and a hundred and twenty feet in depth. Its sides were formed of distinct horizontal strata, and between several of these beds were exhaled vapours having the odour of fuming vitriolic acid. The bottom was composed of wrecks of scorix, through which arose sulphureous fumes that gave a yellow colour to those portions of its sides into which they came in contact. When we first visited the

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crater Dolomieu it retained nearly the same dimensions as those described by M. Berth; except that it was now more shallow on the southern side, which appeared to me to have been occasioned by some internal commotion of the mountain.

We now stopped upon the brink of the crater Dolomieu for the night; but the negroes never closed their eyes, for they were less fatigued and more afraid than on the preceding evening. Our beds were besides extremely rugged. I sometimes slumbered; but was frequently awakened by the cold, and by the dreadful noises which occasionally proceeded from the volcano. This noise was very different from the incessant uproar occasioned by the ascending spouts of fire; and resembled a continued discharge of musquetry, though somewhat louder. We were surrounded by flame, a circumstance which always appeared to me new and incomprehensible when I started from sleep. Jouvancourt expressed his astonishment at our feeling no inconvenience from the heat of the volcano, when we lay so near its mouth; and certain it is that we could not thus have withstood the heat of an equal quantity of burning timber. Is this attributable to the moderate temperature of volcanic fire, which may be supposed to fuse the object which it attacks rather by its constancy than by its violence; or must we ascribe it to a diminished transmission of caloric, caused by the rarity of the air in these superior regions of the atmosphere?

At sun-set the thermometer stood at 11° , and at night 6° above zero. Towards the morning it sunk below the freezing point. At day-break it again ascended to 5° , at sun-rise it quickly rose to 10° ; and on being plunged into a crevice of the crater to $13^{\circ}\frac{1}{2}$, in the space of half a minute.

CHAP. XV.

FROM THE CRATER, TO ST. JOSEPH.

October 1802.

HAVING cast a last glance into the fiery gulph, we departed still overwhelmed with admiration. After leaping the large and profound fissures which surround the crater Dolomieu, and traversing the scorix at the base of the central crater, we reached one of those smooth currents of lava already mentioned. It was now necessary to plunge into an ocean of vapours which had not been dissipated during the night; and which, far from clearing up, became more dense in proportion as we descended towards the inferior region; so that we could scarcely discern our way, and were obliged to keep close to each other lest any of our company should go astray.

This current having terminated, I flattered myself with finding another parallel to it, at a small distance towards the right. But it was in vain that we advanced in this direction: nothing was to be met with except scorïæ. Compelled to walk at random over the scorched sides of the volcano, I knew not whither to direct our steps, and encountered every moment new obstacles. Jouvancourt as well as myself was nearly shoeless; and we were obliged to stop every moment in order to fasten round our feet what remained of the soles, by means of packthread. It was thus that we had walked during the space of four hours, when, exhausted by fatigue and hunger, we found it necessary to stop in order to recruit our strength. Our provisions were wholly expended, except a small quantity of arrack which was insufficient to appease our thirst, and none of us had the smallest idea respecting the situation we now occupied: it was certain only that from the time which had elapsed since we set out, we ought to have been near the plain of Osmondes, if we had not lost our road.

It now began to rain very abundantly; which partly diminishing the mist, Jouvancourt was enabled to distinguish at a great distance to the left the Piton Faujas from which we had wandered, and towards which it was necessary we should again direct our steps: but the fog setting in anew, once more concealed it from our sight.

It was not till after the lapse of five hours, that, almost perishing with hunger, and our feet lacerated in a terrible manner, we arrived, as if by miracle, at our camp. On reaching that region where vegetation re-commences, so excessive was the thirst we experienced, that in order to allay it we sucked the branches wetted by the rain, as we passed along; for we met not with a single spot on this volcanic soil sufficiently compact to retain a drop of water on its surface.

On entering our camp we found it inundated; the blacks to whose care it was left, not having possessed sufficient foresight or activity to construct an additional covering, though it had rained during the whole night on the plain of Osmondes. Before even attempting to repair our camp so as to exclude the rain, we found it necessary to dress our feet and take some repose. We satisfied our hunger by eating the remains of the rice which the blacks had boiled for their own use.

On awakening, the sun which gilded the plain of Osmondes, and the rocks by which it is circumscribed, produced in my mind the most agreeable surprise, as I had apprehended the rain would continue for several days. We now proceeded with as much haste as possible to follow the path we had partly cleared in our ascent to the volcano. The clouds however began to collect in the re-

gions beneath, concealing from our sight the sea, and covering a part of the Brûlé; and in a short time were precipitated upon us in the form of a violent rain.

In order to preserve the plants I had collected during our excursion, I caused the packets of grey paper in which they were contained to be wrapt up in my cloak and coverlet; preferring rather to be wetted myself, than to lose the treasures I had acquired at the expence of much fatigue.

Among the vegetables which grew upon the sides of our path, my attention was particularly attracted by a *Pandanus*. It differs by its fruit from those species I have already mentioned. Being yet unknown to botanists, I have given it the name of *Pandanus Sylvestris**.

I felt great reluctance to again encounter the sharp and rough volcanic slags by which our feet had been formerly so much lacerated, and with which the current we had now reached seemed to abound; but was agreeably disappointed when I found its surface smooth and solid. Here and there we found some small spots covered with shrubs; and in other places the *Pteris osmundoides*, *Polytrichum commune*, *Scirpus iridifolius*, *Lycopodium affine*, already prepared the soil to support a more varied vegetation. Here likewise we found water contained in some cavities of the lava.

After traversing the current of 1787, we arrived at an early hour on the borders of the sea; where we rested with that satisfaction which is experienced after surmounting great obstacles, and succeeding in a difficult enterprise.

Few or no basaltic prisms occur along the coast. Those who believe that basaltic lavas owe the form under which they usually appear to the sudden shrinking which they have experienced on coming when in a state of fusion into contact with the sea, will expect that the coasts of the ocean should here resemble the sides of Fingal's cave; but no such phenomenon presented itself to my observation. Though the compact portions of the currents consist of a pure basaltic lava, the mass is nearly continuous along the whole extent of the volcanic plain; and wherever it is broken, it exhibits only unequal blocks with irregular sides and angles, and never disposed in a series like the pipes of an organ. These angular blocks, at first contiguous, are gradually separated by the incessant beating of the waves; and, falling from their places, form a range of breakers which render this district of coast inaccessible.

In traversing the great Brûlé the whole way to the sea-shore,

* *Pandanus sylvestris*, caule arboreo, ramis ternatis, oppositis alternis; fructibus rotundis, longè pedunculatis. N.

bearing that name. Even the disposition of these two torrents is extremely similar.

During the eruption which formed the little Brûlé of *Sainte Rose*, the colonists, fearing that this terrible volcano might lay waste the rest of the island, repaired in procession to the *Pays-Brûlé*, with M. Kriaise, a priest, at their head, who conjured it to be more quiet, and entreated heaven to restrain its ravages within the limits assigned to it by nature. As this ceremony was performed in a remarkable part of the ravine, south of the Brûlé, the name of M. Kriaise was given to the torrent. But the volcano, far from respecting the recommendation of the pastor, seems, on the contrary, to have taken a pride in directing its lavas towards the very scene of the *august ceremony*. This procession, however, served to confirm the opinion of the power of the devil over the mountain; for the priest pronounced his anathema from the top of a large stone, and the succeeding eruptions of lava have chanced to spare this sacred relic. In many places the lava has flowed over trees, consuming them entirely, or converting them to charcoal; which afterwards decaying, leaves large holes distinctly marked with the bark and smallest knobs of the trees. M. Hubert, who formerly visited these places, had sent to M. Faujas de Saint-Fond several beautiful specimens of volcanic productions incrustated in wood: these specimens afforded matter of admiration to every geologist who had an opportunity of examining them.

I have already mentioned that the crater Dolomieu was produced by an eruption which occurred in 1791, from the central crater. I shall here transcribe from an excellent manuscript of M. Berth's, some observation on this subject.

"I visited, for the first time," says he, "on the 26th of June, more than half a league from the sea, on the banks of the rampart Kriaise, opposite to that of *Bois-Blanc*, a current of lava which seemed to proceed from the *Piton*, but which however I could not distinguish on account of the clouds with which it was covered. This current was precipitated from what is called the *Platform*, for an extent of half a league; and stretching at first along the ravine Kriaise, it afterwards makes a bend and directs its course towards the sea. During the night, at some leagues distance, this current of lava presented the appearance of a large river of fire, which cast a gleam over the sky. In the day time the fluid mass had a dull black aspect, and emitted white and thick smoke from its upper surface. I was surprised at this circumstance, but my guide assured me that lava is never observed to smoke except at the moment of congelation. I remained several minutes within three or four feet of the stream, without being much incommoded by the heat. I did not perceive, on approaching it, any sulphureous odour, but only a slight smell of wood-

smoke from the trees that had been burnt down in its course. Though the surface becomes solid in a few seconds, the fluid part of the current frequently breaks through this thin incrustation, and forms fresh streamlets, which harden in their turn. Besides crystals of sea-salt formed by the liquid matter coming in contact with the ocean, I observed in the lava martial vitriol in the form of minute globules on foot-stalks; and very small quantities of a species of mineral alkali, but no sal ammoniac."

After traversing the Brûlé, we very soon arrived at the ancient mouths of the ravines Tremblet and Citrons Galets. These ravines afford a striking example of the instability of every thing that exists. They had long carried to the ocean their foaming waters, which were at last dried up by streams of liquid fire that filled up the canals which conducted them: this event occurred in 1800; and M. Hubert, who was an eye-witness of it, has furnished me with the following particulars:

"The eruption which broke through the rampart on the 2d of November, 1800, near the source of the ravines of *Citrons-Galets* and *Tremblet*, reached the sea on the 8th of the same month, at nine o'clock in the evening. The lava fell in three separate currents, and in a perpendicular direction, from the height of eighty or a hundred feet. The middle stream was as fluid as water: the other two flowed with the apparent consistence of honey. This eruption was the only one which presented me with the spectacle of such a fine cascade of fire. I am, besides, indebted to it for two observations which are new to me. When the lava reached the sea, I observed fragments of slag, some of the size of a man's fist, thrown to the height of fifteen or twenty feet. On attending to all the circumstances, it was easy to perceive that their projection was owing to water reduced to a state of vapour.

The steam which proceeded from the blending of the waves with the lava, was impregnated with salt. The trees in the neighbourhood, the rocks, and our own bodies, were speedily whitened with this salt, which fell in a very fine powder. The sea, extremely boisterous in this place, struggled with wild uproar against the lava which encroached on its domain; and, forced to retreat before its masses, left them often nevertheless covered with water, which also was converted into crystals of salt. From this last proceeded the impalpable powder which was wafted aloft by the smoke and the impulse of the aqueous vapour. Should we not ascribe the formation of sea-salt found in volcanoes, to events similar to that which I now relate? I observed a large stone, as well as a number of pebbles, darted by the sea into the burning stream, in which they remained imbedded; and I doubt not that at some future period geologists may reason

very profoundly on the manner in which these extraneous bodies have been incorporated with the basaltic mass.

I found here a fig marygold, *Mesembryanthemum*, with succulent, linear, and triquetrous leaves. This plant vegetates in the clefts of the lava, as well as the *Lobelia polymorpha*, *Sideroxylon cinereum*, Lam. which abound in the *Pays Brûlé*, and attain here a prodigious height. Immediately on leaving the *Pays Brûlé*, I met with a plant growing in great profusion, of which I had hitherto seen only a few wretched specimens, at the point of Bourbier: I found it near the sea-shore, on some currents of lava on the outside of the rampart or inclosure. This plant, which is somewhat succulent, and not easily preserved in herbaria, grows in the chinks of the lava, or in the crevices of the rocks near the sea. M. Ventenat has named it *Lubinia spatulata*; after M. de Saint-Lubin, who formerly accompanied Commerson in several of his botanic excursions.

CHAP. XVI.

FROM THE RAMPART OF TREMBLET, TO THE BRULÉ OF BASSE-VALLE'E.

October 1802.

AT a short distance from the ravine of *Citrons-Galets*, we left the sea-shore, in order to climb up the embankment at the foot of which we had travelled since leaving the *Pays Brûlé*. This rampart was not above fifty feet high, and the parish of Saint Joseph commenced at its summit. The whole of this newly peopled district is still wild and uncultivated, and its soil is nearly similar to that of *Bois Blanc*. A forest of majestic trees, as well as a variety of shrubs, grow on those portions of the lava which are so much decomposed as to be capable of supporting vegetation. I remarked among a great number of others a beautiful palm-tree, which the blacks call *palmiste-poison**. The bitterness of its cabbage, which is of a yellowish colour, has doubtless given rise to this opinion; for it is not in fact dangerous, being frequently eaten by the Creole females.

We had not tasted food since the preceding evening, and had walked six hours exposed to a pretty violent shower of rain. Two or three palm-cabbages which we had met with near the point of Figures, now furnished a frugal breakfast. We had yet to proceed a considerable way before reaching the place where we intended to stop; when one of our blacks informed us that

* *Areca lutescens*, petiolis inermibus, glabris; stipitibus inermibus, ramosissimis, ramis flexuosis, fructibus subtorulosis. N.

we were near the house of a white inhabitant, named Kerautrai, whom he had formerly known, and who he affirmed would receive us with the greatest pleasure; but we hesitated respecting the propriety of presenting ourselves, without any kind of introduction, at the house of this person.

While we were deliberating on the subject, we observed through the trees two men approaching us. One of them, who was tall and robust, carried on his head some honey contained in a kind of vessel made of the leaves of the palm-tree; the other, who was more advanced in years and not so tall, preceded him. They wore neither shoes nor stockings, and were clothed in a shirt and pantaloons of blue linen. They had heard us deliberating on the measures we meant to adopt. He who appeared to be the eldest, politely addressed us; and after informing us that he was Kerautrai, of whom we had been speaking, insisted on being allowed to supply us with provisions, and warmly invited us to his house. The candid and frank address of this honest man, induced us without hesitation to accept his invitation: we accordingly accompanied him, and after a short walk arrived at his habitation. The settlement here formed by M. Kerautrai was the first that we had met with since our departure from M. Deschasseurs.

Though we had not remained long in these sequestered regions, yet the horror and novelty of the scenes presented to my view had so completely disordered my usual ideas as almost to make me believe myself in a new world when I again beheld spots fertilized by the efforts of man, and subjected to the operations of industry.

Saint-Joseph, from the *Pays-Brûlé* to the rampart of the *Basse-Vallée* towards which we were proceeding, is in some sort separated from the rest of Bourbon by barriers interposed by nature herself. This parish only began to be peopled about eighteen years ago. Till that time, wild goats, some other animals, and a few Maroons, were its only inhabitants. Every thing seemed to condemn it to a state of perpetual sterility: a tempestuous sea, inaccessible coasts, declivities untrodden by man, the total want of springs, immense sheets of unproductive lava, a barren and stony soil,—such were the obstacles against which the first settlers of *Saint-Joseph* had to struggle. The inhabitants are chiefly composed of Maroon hunters; and are men of colour, without landed property, born free from father to son, whose wives are purchased slaves, and their children black. They are too proud to stoop to regular labour; yet, habituated to privations of every kind, they are at once active, indefatigable, and slothful. So very tenacious are they of their *white* original, that they deem it an insult to be called *men of colour* or *free*

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negroes. Just but stern to their slaves when they have any, they are cruel and unrelenting to the unfortunate Maroons who fall within their power. In other respects they are frank, full of candour, incapable of suspecting deceit, hospitable, and generous. Nearly abandoned to a state of nature, they hardly know that a mother country exists. The revolutionary commotions which had excited fatal disturbances even in the Isle of Bourbon, respected the deep forests which shade the basis of the volcano.

These men of colour at first supported themselves merely by means of fishing and the chase; to which they devoted themselves with so much activity that they very soon destroyed many of the wild animals, and diminished the number of fish on the coast. It was thus that several species of animals peculiar to Bourbon were wholly exterminated.

If any credit be due to the narrations of travellers, there existed at Bourbon, when first discovered, a very large bird, which they named *Dodo*, in every respect similar to that which M. Buffon has described under the appellation of *Dronte**. The *Didus* or *Dronte*, according to writers on natural history, was observed in the Islands of France and Bourbon by the first navigators who landed there. Its extraordinary form struck them, but they might perhaps exaggerate the ugliness of this bird. Its stupidity, its sluggishness, its incapability of flying, its awkward gait, its deformity, and bulk, all seem to have operated to accelerate its destruction. When man takes possession of any new country, the animals which before had enjoyed quiet and abundance, fly on his approach, and seek shelter in wild and uncultivated places into which he has not yet penetrated. But the *Didus* could not, from the circumstances already mentioned, elude pursuit; and soon fell a victim to its enemies. If any individuals of this species still exist in the interior recesses of the island, their preservation seems ascribable to their want of action, which conceals them from the sight and pursuit of the Maroon hunters. The reason then why the *Didus* is no longer seen in the same islands where it was first discovered, must either proceed from the complete extermination of the species, or from a few individuals only existing in retreats which man has not yet explored. But it would be wrong to conclude that this bird has never existed, as some modern travellers seem inclined to think, merely because their researches to discover it in islands well peopled and cultivated have wholly proved fruitless.

The form of the *Didus*, however monstrous it might appear at first sight, was doubtless best suited to its mode of life, and the places it frequented. It is generally believed that a bird of

* *Didus ineptus* L.

which Leguat has given us a description, and which he frequently saw during his residence in the island of Rodrigue, was the same as the *Didus* now under consideration. According to the narrative of this traveller however, it seems to have been much less clumsy, and of a more perfect conformation.

As Rodrigue is older land than Bourbon, ought it not to present species of animals more perfect than those which inhabit the latter island, the soil of which being so recent as scarcely to bring to perfection either vegetable or animal beings*? Is it not remarkable that in three islands nearly similar in their soil, climate, and other circumstances, there should have existed three birds of the same genus, resembling each other in their principal features, and which on no supposition whatever could have passed from the one island to the other?

Be this however as it may, I am afraid the existence of these monstrous birds will remain involved in obscurity, unless we can discover some kindred species in the island of Madagascar, which I doubt will never be the case. They will more likely be found on some desert and volcanized island under the same parallel of latitude, abounding in similar productions, and possessing an equally recent soil.

I have made the strictest inquiry possible respecting the *Didus* and the bird of Nazareth; but neither in the isle of France nor Bourbon have the oldest hunters been able to give me any satisfactory information on this subject.

Bourbon at one period also abounded with land and sea tortoises. The latter deserted the sea-coast after many of them had been destroyed on account of the excellence of their flesh; and the former, being unable to seek their safety in flight, have been wholly extirpated.

There were likewise formerly a great number of stags in the island of Bourbon, which I was assured were the same species as those which exist in the Isle of France. About eight years ago one of these animals was killed near the *raviné Blanche*, in the district of *Saint-Pierre*, and I believe it was the last that has been observed in the island.

The black cattle sent by M. de Flaccourt from Madagascar in 1649 and 1654, have greatly increased in number. It appears that the Portuguese, according to their usual custom, had left at Bourbon a long time before, black cattle and horses as well as hogs and goats. These animals, while they were allowed to range at large, rapidly multiplied; but since that period all the

* The Isle of France, if any credit be due to the narration of travellers, produces likewise a third bird nearly allied to the *Didus* in its natural characters, *Didus Nazareus* L.

horses have been domesticated, the hogs wholly destroyed, and only a few of the goats left, which last owe their safety to the incapacity of the hunters to pursue them to the inaccessible parts of the island.

We were informed that about twenty-five years ago there still remained some of these bullocks in the neighbourhood of *Saint-Paul*. With the view of entrapping them, the Creoles dug deep square pits in those places they habitually frequented, which were carefully covered with the branches of trees; and afterwards killed the animals which were so unfortunate as to fall into these snares.

Flaccourt gives it as his opinion, that the flesh of the hogs of Bourbon affords the most delicious food, which he imputes to their chiefly subsisting on the large tortoises.

M. Kerautrai having entreated us in the most cordial manner to stop at his house, we readily accepted his hospitable offer. His habitation consisted of two chambers: and we found his wife seated in one of them on a mat, surrounded by four or five little brown children. This woman was of a large stature, very black, and still retained the appearance of having been very beautiful: Kerautrai had purchased her twenty-five years before, had afterwards emancipated, and made her his wife. The other man whom we met in company with our host, was his brother-in-law: he had been five months a widower, and still wept whenever the name of his wife was accidentally mentioned in his hearing.

On our arrival, M. Kerautrai said to his wife, who arose on our entrance, These, my love, are some whites who have been passing this way, and stand in need of refreshment: let us have dinner. Arrack was in the mean time presented, and our host seemed evidently flattered by our drinking his health. He soon drew me aside, as if intending to communicate some important secret; and pointing to Cochard, inquired if he was *free*, or a *black*. Although our guide was a man of colour, I readily replied that he was *white*. Put down four plates, cried M. Kerautrai to his wife; and he immediately sent away our four blacks to eat with his four slaves in a hut about twenty paces from his dwelling.

When this worthy man learnt the cause of our journey, and saw the lavas and plants with which we were loaded; when he examined the drawings I had made, and the instruments with which I was furnished; he conceived the most exalted opinion of our science and our courage. He besides had the politeness not to tease us with any questions; which is too much the custom in some of our own provinces, when a naturalist happens to stop at one of the houses of the peasants.

Coffee was now served round, which we sweetened with honey instead of sugar. M. Kerautrai entreated us to remain with him at least the following day; and with the view of engaging us to

acquiesce in this request, he promised to conduct us to a place abounding with some beautiful plants. I would not accept this obliging offer, from a fear of incommoding my host; but I accompanied him in a walk round his little domain, and he appeared much flattered by the attention with which I examined every thing which he pointed out to my notice.

Thirty bales of coffee, and fifteen clove-trees which had borne fruit for the first time, constituted the principal part of M. Kerautrai's revenue: he likewise possessed a great stock of bees, from which he obtained an ample supply of honey. The majority of the inhabitants of the parish of *Saint Joseph* subsist chiefly on the profits arising from this branch of rural economy: they scoop out the old trees, in order to form what they term *bombardes* or hives; and these habitations being thus prepared, they proceed to the woods, and commence a search for bees upon the tops and in the holes of the trees. The honey in Bourbon is excellent: and that in the parish of *Saint Pierre*, which is termed *miel vert*, is esteemed superior to that of any other country; which is attributed to the bees drawing their nourishment from the *Mimosa heterophylla*, and a tree which in the country is termed *Tanrouge*, a vegetable belonging to the genus termed by botanists *Weinmannia*.

The inhabitants of *Sainte Rose*, being almost wholly ignorant of the use of money, carry on the greatest part of their commerce in the way of barter. When I visited the district, those who supplied the settlers with arrack, blue linen, gun-flints, pipes, powder, and shot, which are the principal articles bought by the Creoles, forced them to pay an extravagant price for them in coffee or honey.

Immediately before leaving the hospitable dwelling of M. Kerautrai, an incident occurred which greatly lessened the high opinion he entertained of us.

The son-in-law of M. Kerautrai, who, besides the death of his wife, mourned likewise the loss of his father, whose property he inherited conjointly with three other brothers settled in different parts of the island, had received a letter a few days before, which he entreated us to read. As not one of the family had been taught to read, he had kept it till an opportunity occurred of being made acquainted with its contents. On casting my eyes over this scrawl, I attempted at first to make out the signature, but could not succeed; after guessing, however, at some of the letters, the Creoles immediately exclaimed, *Ojard!* It was this Ojard who attended my poor father, said the son-in-law of Kerautrai; who added, sighing, It was he that could not save my poor daughter. M. Ojard was a physician, and in their opinion an intelligent man. They fancied he could

write, since I held one of his letters in my hand; while I, who was unable to decypher his manuscript, must have appeared in their eyes not to know my alphabet: it was a very natural inference. I was so much occupied with this idea, that I could not make out a single word of his billet. In this embarrassment I called to my assistance Jouvancourt: who saw the matter in the same light as myself; and was so much disconcerted, that he replied without hesitation, I cannot read a syllable of it. My feelings may easily be imagined on perceiving how much this occurrence had lowered me in the estimation of these Creoles; and the reply of Jouvancourt, who was nevertheless a well educated youth, tended to complete my embarrassment.

The best of this adventure was as follows: Cochinard, in one of our first excursions, had informed us he could read and write. One day when I was very much occupied, Cochinard was displaying his talents in the eyes of our other people, in such a manner as to occasion me considerable disturbance; when, in order to render him silent, I put into his hand a letter I had received from the isle of France, and requested him to read it. Not having succeeded in his attempt to do so, the blacks laughed immoderately at his expence. Seizing the present occasion to repair his wounded pride, he approached; and taking the unfortunate billet from my hand, began to read quite out of breath.. Being perfectly acquainted with the orthography and the mode of writing common in the island, he succeeded in decyphering it.

Among other subjects contained in this letter, M. Ojard acknowledged having received from the son-in-law of M. Kerautrai five bales of coffee, as a compensation for his trouble in attending the father. The doctor proceeded to inform him that he had returned them, being unwilling to take the trouble of running through the island in order to collect his payment. One of the heirs, he maintained, ought to see the other three brothers, and concert measures to transmit at once the twenty bales of coffee, which were the amount of his fees on the present occasion. The letter of this Esculapius began thus: *Guvausinbal*, all in one word; which was intended to signify *J'ai eu vos cinq balles*, "I have received your five bales."

The enigma being solved, the unfortunate son did not complain of the letter of M. Ojard. I was so much affected by his resignation, and by the villainy and impertinence of this medicaster, that recovering a little confidence, I endeavoured to convince these poor people how much more likely such a man was to kill than to cure his patients. I proceeded to affirm, that as it was impossible M. Ojard could be acquainted with the nature of different maladies, it would be much better to trust to the efforts of

nature for a cure, than pay an ignorant pretender to accelerate the progress of the disease. M. Kerautrai was convinced by my arguments, and assured me that if he fell sick he certainly would not consult M. Ojard; or at least, if necessity forced him to the adoption of such a step, he would previously stipulate that no charge should be made but in the event of a complete cure: adding, It will be a sufficient misfortune for my children to lose me, without losing besides *twenty bales of coffee*.

Still proceeding through the wood, after leaving the habitation of M. Kerautrai, we soon crossed a small ravine named *de Rencontre*, and arrived at the *Brûlé de la Table*. According to tradition, the *Ravine de Rencontre* received its name from the two first whites who ever undertook to explore the interior of the island, having unexpectedly met on its banks.

The *Brûlé de la Table* is the last of those which have been formed in modern times. In 1776 it burst from the bosom of the earth, through a very inconsiderable crevice at a small distance from the sea-shore. Near its origin it divided into two currents; the one forming the *Ravine de la Table*, and the other that of the *Taka-maaka*: and these ravines have given their names to the two branches of the *Brûlé*.

The first of these currents which our road intersected, was of considerable extent. No scoria rendered our path disagreeable. On its sides I observed the figure of several large trunks of trees which had impressed the lava when in a semi-fluid state. One of them had left a hole of about four feet in diameter, and nearly six or seven in depth. The little *Brûlé* of *Taka-maaka* is much more circumscribed than that of the *Table*; as a thicket of wood which seems to have escaped the ravages of the burning lava is found upon its surface, at the place where it is usually crossed by travellers.

The current of 1776, after having laid waste the forests which it met in its course, and filled up the cavities hollowed out by the waters in the bed of the ravines, the direction of which it followed, exhibits on arriving at the sea a most magnificent spectacle, by the formation of an immense cape projecting from the shore for the extent of about three hundred and fifty toises. This cape rises above the level of the sea from twenty to thirty feet. Its whole mass, according to the calculation of M. Hubert, is nearly eight hundred and forty thousand solid toises. By allowing besides to the currents, at a medium, twelve hundred toises in length, a thousand in breadth, and five and a half in thickness, the product of this eruption will compose a mass of nine millions three hundred and fifty thousand cubic toises of lava.

Reflecting on this immense quantity of matter ejected from

the volcano of Bourbon, we are naturally led to inquire whence it proceeds. Its prodigious magnitude appears to afford an unanswerable objection against the opinion that the fire of volcanoes is situated near the summit of volcanic mountains. If this were the case, the volcano of Bourbon, undermined by its copious eruptions, must have sunk under its own weight since the island was inhabited. It is in the bowels of the earth, in the very centre of our planet, not yet firmly consolidated, that the forges of Vulcan exist; and the numerous burning mountains which are every where scattered over our globe, can only be considered as the spiracles of these vast laboratories. I believe there exists not one the effects of which are more constant, or the eruptions more frequent, than that now under consideration. If it is less celebrated than Vesuvius and Etna, it is because it is less known. Its fires having exerted their destructive power only upon solitary forests in an island long unknown, could never, had they even been still more terrible, have excited the same degree of interest as the most trifling eruptions from the Italian volcanoes, surrounded as they are by populous cities and magnificent monuments of art.

Since the commencement of the christian era, twenty-seven eruptions have taken place from mount Etna, and twenty-four from Vesuvius: those from mount Hecla have not been reckoned with accuracy. M. Hubert has written to me, that since 1785 he has observed the volcano with the greatest attention; and the results of his observations are, that it has ejected lava at least twice every year, and that eight of the currents to which it has given birth have even reached the sea shore.

The sides of the Brûlé are covered with vegetation. The *Polypodium phymatodes* L., *Dicksonia abrupta*, *Andropogon aureum*, &c. already abound on the skirts of the forest, while the other parts of the current still preserve all their aridity. It is not then to the decomposition of the lava that we must attribute the rapidity with which vegetation has begun to display itself on the borders of the currents of the *Table* and *Taka-maaka*.—It is in vain to endeavour to ascertain the precise time which is requisite to convert the surface of volcanic strata into vegetable earth. This depends on a great many collateral circumstances; but in general, lavas which flow through forests are very quickly in a fit state for the production of plants and vegetables.

Where the Brûlé terminates towards the sea, we observed a small protuberance about twenty feet in height; evidently formed by some internal commotion having raised the superficial beds of lava, which are now congealed in the form of a hillock of earth raised by

a mole. We soon descried a similar protuberance, the constitution of which being analogous to that of the whole island, conveyed a very correct idea of the manner in which Bourbon has been formed. The other parts of the *Table* are divided by declivities and large crevices, by means of which we were enabled to perceive different beds of lava separated by horizontal fissures, and which we might have supposed to be the product of various successive eruptions had we not previously known that the point of the *Table* was formed by a single current. Here we found immense banks, which by subterranean convulsions and other causes have acquired nearly a vertical position, after having originally congealed in horizontal strata. The disorder which is in this place every where apparent, serves to explain certain appearances in some volcanic embankments, the cause of which it would be difficult to divine, if nature in this island did not as it were exhibit her operations to the eyes of the observer.

After having crossed the *Brûlé of Taka-maaka*, we again entered the wood, through which we continued to travel till we arrived at a place named the *Mare d'Arzute*. In our way I found several interesting plants, the principal of which were a *Dicksonia repens*, *Pteris scolopendrina*, *Cossinia triphylla* Lam., and three others belonging to the genus *Pittaria*.

It was evening when we reached the house of M. Delcy, to whom M. Hubert de Montfleury had given us a letter of introduction. M. Delcy came to meet us, accompanied by his son. His habitation is situated in the midst of a thick forest, where a virgin soil gives that air of wildness to its productions which it requires a great many efforts and long-continued culture wholly to destroy. In this isolated dwelling, which we reached by vast wastes and unfrequented forests, we found to our surprise an amiable family, possessing all the graces and charms of the most polished society.

Our blacks having received several wounds in their feet and legs, as well as Jouvancourt, who had not fared much better, I resolved to remain a few days with M. Delcy. Embracing this interval of leisure I set about arranging the collection I had made during the last few days.

Not being at a great distance from the sea, we embraced this opportunity to visit its rocky shores, against which the waves broke with uncommon fury even during calm weather. In this place we observed a small bason of brackish water, which was not above twenty-five feet in circumference. As no fresh water could be discovered in the neighbourhood, it was remarked by those who first penetrated into the parish of *Saint-Joseph*. This

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bason, called *Mare d' Arzule*, is so inconsiderable as not to merit being noted on the chart.

The east winds, which are extremely rare in those parts of the island we had visited, were very prevalent during our stay here. Some gramineous plants grew in scattered tufts on the shore; and at a short distance I remarked a beautiful species of *Pandanus*, which differs from those usually cultivated by bearing larger fruit, and being of a more sanguineous colour.—On leaving the *Mare d' Arzule*, we continued to traverse forests similar to those we had crossed since our departure from the *Pays Brûlé*, and the soil of which was likewise composed of lavatic fragments. We soon reached a ravine named the *Mare Longue*, which descends from a platform we intended to visit: where it enters the sea the coast is steep, and chiefly composed of beds of very red pouzzolana of the same kind as that which we observed in the creek of *Bambou*. The sea which we overlooked appeared sufficiently calm; and though the waves dashed with considerable force against the shore, several fishes sported in the midst of the breakers. A species which the negroes call *perroquet*, appeared to me to belong to the genus *Labrus*; it was from ten to fifteen inches long, and yielded neither in colour nor brilliancy to the emerald. Cochinard, in order to evince his dexterity, shot several of them, but we could not succeed in taking one alive.

On the opposite side of the *Mare Longue* we fell in with an immense current of lava called the *Brûlé* of the *Basse Vallée*. Its surface was as naked and black as if it had been only of yesterday, and still displayed a perfect representation of those figures which had been imprinted on it when in a fluid state. The time of its formation has not been ascertained. I at first supposed that some parched and burnt up trees which are found near its source might have some connection with the age of this current, in which case it must have occurred at no very distant period; but I have since been informed that the trees in question were destroyed by fires lighted near this spot by some imprudent hunters.

The road across the *Brûlé* runs between two protuberances very similar to those of which we have spoken in describing the current of lavas of the ravine *de la Table*.

One of these hillocks is situated on the sea shore; the other, which has been named by M. Hubert the *butte Hamilton*, is somewhat more to the right. After leaving the current of the *Basse-vallée* we crossed a little thicket of shrubs, intermixed with several species of the *Pandanus*, which some humble crosses formed of reed and fixed in the crevices of the lava

made us conclude to be the cemetery of the parish. The church is distant from it nearly two leagues.

We were not long in reaching the ravine of *Baril*; so named because at the place where it enters the sea there is an elliptical arch, in the centre of which is a cylindrical spiracle very much resembling a small barrel with its head knocked off. This arch with its spiracle, is exactly similar to the one we saw in the ravine of *Kriaise*, and has probably been likewise formed by means of a tree falling among the fluid lava. Being open towards the sea, the waves frequently enter it with a considerable noise; and afterwards escape through the spiracle in the form of white foam, which is thrown to a prodigious height, and exhibits a very beautiful spectacle. We found in the vicinity of this place fragments of basaltic prisms detached by the force of the waves from some columns, of which traces were distinguishable along the coast.

CHAP. XVII.

EXCURSION FROM THE BRULÉ DU BARIL, TO THE RIVER D'ABORD.

AFTER passing the *Ravine du Baril* we arrived at a current of lava in appearance very recent, which we found so extremely rugged as to be nearly impassable. Even the Creoles, who are the most accustomed to travel over scoræ and gratons with naked feet, cannot traverse this without shoes, or enveloping their feet in the leaves of the cabbage-palm. Its surface is extremely dry and barren, while in all the other lavas yet seen by us we observed different vegetables springing up through their chinks and crevices.

The *Brulé du Baril* appears as if it had been only lately produced. Nature seems as it were to have exerted herself to display something extremely hideous. Chaos itself could scarcely present an idea of such complete disorder. Every thing recalls to our mind ruin and desolation. Let any one conceive a sea as black as ink, incessantly agitated by violent storms, and congealed at the very moment when the billows are thrown to a great height and broken into foam, and he will then form a very exact idea of the current of lava under consideration. This current is wholly composed of black *graton*, very sonorous, full of asperities, and of an almost inconceivable hardness. These *gratons*, when narrowly examined, are found to consist of basalt extremely ponderous, of a fine black grain, though somewhat brittle, and interspersed with slender plates of talc.

Along the sea-coast the Brûlé, which may be about a quarter of a league in breadth, forms a great declivity nearly a hundred feet in height. It is divided perpendicularly, and composed of rocks heaped on each other in frightful disorder. Its black colour variegated with red exhibits a very dismal appearance, by the contrast which it forms with the dazzling white foam of the billows breaking with dreadful fury against this desolate coast.

We observed in this place that the Brûlé contains various strata; the nature, dimensions, disposition, and colour of which, are very distinct, though it is probable that the currents which form them have flowed at the same period. These strata are composed of compact lava of a beautiful slate colour, and of greyish and somewhat brittle basalt; with other porous lavas, which intersect in an oblique or horizontal direction banks of scoræ indurated like those of the surface of the Brûlé, and puzzolana of different colours.

If, instead of pursuing the beaten tract, we proceed along the shore after leaving the rugged part of the Brûlé, we soon reach a small projection and a considerably larger creek. Here the currents of lava for nearly two or three hundred toises along the coast form with the horizon an angle of more than thirty degrees, like the strata we remarked at the base of the *Piton Rouge*. The inferior parts are formed of black and very hard basalt, disposed in prisms of a very large diameter, extremely regular, and sometimes a little bent. These prisms constitute the whole projection; which stretches into the sea for about fifty paces, and very much resembles a pier built upon piles: towards its middle it loses the prismatic configuration, and through a kind of arch which supplies their place may be seen the light from the opposite side.

We here observed that the lavas of the *Brûlé du Baril* contained fewer chrysolites than those in other parts of the island; but that these were frequently as large as nuts, and even sometimes as apples.

Vast numbers of very large dark-coloured birds, whose cries are extremely disagreeable, take up their residence in the hollows of these steep shores. We killed several of them, but were not able to procure a single individual alive. The Creoles call them *maquois*. They subsist on the fish which they take on the rocky reefs near the shore.

We at last arrived at the ravine of the *Basse-Vallée*, and at the base of a rampart by which our prospect had been limited since the morning. This ravine descends through a thick forest from north to south, and is always destitute of water except during great rains.

The rampart of the *Basse-Vallée* is similar to those we for-

merly visited. It is well wooded, and descends from the south towards the *Plaine des Sables*. In some places it is nearly five hundred feet in height; but opposite the rock of which we have already spoken, it is not more than a hundred. A *piton*, or circular eminence, rises majestically towards its centre, and may be distinguished at a great distance: this hillock, named the *Piton de la Basse-Vallée*, has doubtless been the ancient crater of a volcano, but is now covered with wood to its very summit.

It was by a winding and steep path, which a view of the sea immediately under our feet rendered in some places frightful to pass along, that we slowly arrived at the summit of the rampart of the *Basse-Vallée*. Scarcely however had we reached it, when we were tempted to believe ourselves in a different country. Here we immediately observed people on horseback: a circumstance we had not witnessed since our departure from *Sainte Rose*; as these animals are unable to keep their footing upon the *Brûlé*, or descend the rampart we intended to examine.

A certain number of habitations surrounded by well cultivated spots of ground; a milder climate; a greater number of inhabitants, whose very countenances indicated a more civilized state of society; all afforded a striking contrast to the barren and savage deserts we had just left.

Among a number of conical *pitons* which are scattered over this place, we passed very near to that of *Vincendo*, which is the only one worthy of notice. It is situated near the sea-shore towards the right, and very near the mouth of the ravine; and bears a striking resemblance in its form, colour, and dimensions, to the *Piton Rouge* of *Sainte-Rose*. At its summit we remarked a roundish depression, and other appearances indicating it to have been an ancient crater which had inclined towards that part of the shore from whence we had arrived.

The ravine of *Langevin*, at which we arrived in the evening, might be called a river though it is frequently dry, if it were not on account of its vicinity to a much more considerable torrent, that of *Remparts*. Its channel is broad, and its banks lofty; and at a small distance from the sea its embankment is not less remarkable by its vast extent than by its great depth. We took up our abode during the night in a hut, and as soon as it was dawn proceeded to visit the environs.

Here on an open and level spot of ground stands the simple and isolated church of *Saint-Joseph*, constructed entirely of wood. This table-land is cut perpendicularly on the side next the sea, above which it rises to a considerable height. The whole of it is composed of pebbles of different volcanic substances, agglutinated by remains of scorix, puzzolana, and vege-

table earth; from which we may infer that it has been formed by alluvial depositions.

We set out in the evening for the house of an inhabitant of the river of *Remparts*, to whom we had been previously recommended. In our way thither we travelled along the sea-coast, which from *Sainte Rose* is uniformly perpendicular. During our journey we observed flocks of different birds; particularly a species of *Phaeton**, of which Cochinaré killed eight at nine shots. This bird is extremely common through the whole of the district. Some of its nests were brought to me at the house of M. Delcy: they were constructed like those of other birds which roost on trees, and contained two or three eggs of the same colour and form as those deposited on the bare sand by sea-swallows.

There are a great number of caves in this part of the island of Bourbon. We had entertained the design of visiting one of them which opened into the ravine of Langevin, but were informed that its mouth had been recently filled up: we were likewise told that it was excessively deep; and that a detachment which once pursued some black Maroons who took refuge in this cavern, was never again discovered, because no one was sufficiently acquainted with its various labyrinths to risk entering it.

Not being able to visit this grotto, we went to view the caverns which are situated on the declivity on the coast near the *piton* of the river of *Remparts*.

These caverns seem interposed between different currents of lava. Their sides were embellished with a *Conserva* very remarkable by the loose, soft, and beautiful green beds which had been formed in the breaks of the soil. As this species is a nondescript, I have named it *Conserva cryptarum*†, as descriptive of its situation: I have since found it in several caverns of the highest mountains.

The *piton* of the river of *Remparts* where we next arrived, is fifty or sixty toises above the level of the sea which washes its base. Towards the island it is covered with gramineous plants, but is absolutely naked and barren on that side exposed to the influence of the sea-breeze. Its circumference is very considerable relatively to its height: it appeared to be nearly double when seen under certain points of view, from the effect of a sort of interior valley which runs from the summit towards the shore. At its base I discovered great abundance of the beautiful plant termed *Dichondra repens* Smith. It was in the environs of this place that I first began to observe many species of *Latania*,

* *Phaeton aethereus* L.

† *Conserva cryptarum*, filamentis simplicibus, intricatis, articulis approximatis. N.

especially the *Latania Borbonica*, which continued to flourish till we reached *Saint-Paul**. When growing in sheltered situations, its figure is elegant; but those which are scattered along the shore and constantly acted on by the winds, exhibit a very stunted appearance. Some small white bats, of which I could not procure a single individual, seek refuge during the day among its leaves.

Our road, which was sufficiently good, lay across the river not far from the sea. On arriving at the ford we observed a palanquin carried across by four blacks, which recalled to my recollection that such beings as females still existed, and that we were again entering an inhabited country.

In passing the river it was evident from the nature of its sides, that the ground through which it has opened itself a passage, is a deposition formed in the same manner as that at the mouth of East River. But since its formation some volcanic eruptions must have occurred near the place; as a little towards the left from the place where we crossed the torrent, a stratum of lava is distinguishable incumbent on a bed of pebbles, of which the soil is composed. A few wild pigeons flew here and there, and nestled on the sides of the river.

At the summit of the piton of the river of *Remparts* is a small deserted hut, which had been formerly inhabited by the keeper of the signal-post, and from whence we enjoyed a very extensive prospect. About this time I began to experience extreme pain in my left foot. The wounds which I had received during our journey to the volcano, had closed while I remained at the house of M. Delcy, so that I believed myself able to resume my journey with impunity: but the exercise was too fatiguing in my present state; the lower part of my limb was greatly swelled and affected with violent inflammation, which terminated in an abscess, from which I drew several sharp portions of scoriæ. After their removal, the pain and swelling began to abate; and in a short time I was so far recovered as to penetrate to the river of *Remparts*.

We travelled along its banks for nearly an hour; and then descended into its bed about three quarters of a league above our host's house, and a little before what is called *les Sources*. I was much struck with its similarity to East River, and indeed with the resemblance which the whole of this part of the island bears to the opposite side. The *Piton Vincendo* resembles, as I have already said, the *Piton Rouge*: the river of *Remparts* corresponds to the *Piton Rond*, and like it is sepa

* This tree, which is a native of the island of Bourbon, belongs to the family of palms, and never attains to a great height.

rated from the sea-shore; in short, the river of *Remparts*, and the deposition of pebbles that exists at its mouth, recal to our mind *East River*.

My foot became so much worse after walking three hours in the bed of the river, that I was forced to relinquish the enterprize. We stopped about mid-way in its course, in the vicinity of a small miserable settlement named *Islet de la rivière du Remparts*, and which we were informed belonged to M. Ojard, a surgeon: it was the same M. Ojard whose orthography had occasioned me so much embarrassment at the house of the worthy Kerautrai.

Some fallen trees, *Carica papaya* L., about a hundred plants of coffee, a few of the *Sisymbrium nasturtium* L. growing by the side of a running stream, and a miserable hut, constituted the whole of the possessions of M. Ojard. The master and his slave were at this time absent. I know not how it happened, but the appearance of wretchedness which prevailed in this settlement, heightened the interest created by its picturesque situation, the silence and tranquillity of which were only broken in upon by the cries of joy sent forth by our blacks on discovering the *Carica papaya* L. I was wholly unable to proceed farther; and, seating myself in this solitary place, I enjoyed an inexpressible charm in thus resigning myself to repose. Had I not dreaded the return of M. Ojard, I would have remained in his little domain till the re-establishment of my health. Jouvancourt proposed that we should construct a camp a little higher up; but as I was convinced that we should be incommoded by the visits of our neighbour the moment he returned, I preferred measuring back our steps to the hospitable mansion of M. Delcy, from whose house I now determined to depart on horseback in order to explore the river d'Abord.

The soil of the Islet is extremely good, if we may judge by the luxuriant vegetation with which it is covered. Ramparts of a fearful height clothed with dark verdure, above which the palm-tree raised its majestic head to the clouds, seemed to surround us on all sides. Not a breath of wind was to be heard and the most uninterrupted silence reigned throughout this solitude. Abundant streams of pure water issued from the base of the lateral rocks, and after meandering with a murmuring noise over beds of pebbles bordered by flowering shrubs and plants, disappeared beneath the inferior rocks. Beautiful white clouds spontaneously formed around us, which either arose from the bottom of the bason, or seemed to escape from its sides, while others occupied the space above our heads: they all majestically ascended towards the higher regions, where they were rapidly

broken and carried before the wind as soon as they surmounted the level of the embankment.

Towards evening I returned, as well as I was able, by the *Sources de la Rivière des Remparts*. This spot was visited some time before by *Du Petit-Thouars*. The ignorant Creoles of the district, imagining there must be something very extraordinary in the apparatus and white iron-box which he carried, mistook the peaceable botanist for a man dangerous to the tranquillity of the state, or a malefactor who had penetrated into these unfrequented deserts to elude the pursuit of justice. Their terrors, which were increased by communication, at length induced them to follow *Du Petit-Thouars*, whom they overtook just as he had reached the first basaltic prisms. Having stopped and examined him after their own manner, they determined to conduct him under an escort to the river d'Abord; but, happily for the captive, he met, after proceeding a short way between his guards, a respectable inhabitant of the district, by whose interference he was instantly set at liberty.

Being furnished with horses by our host, we departed from the river of *Remparts* on the 5th November. The road, which was no great distance from the sea, was broad and not ill formed. The soil was uncultivated, barren, and much parched by the heat of the sun. The ravines of *Manapany* and *Cafres* were the only ones worthy of notice which we met with in our way: their banks are elevated; and the path, which runs along broken and undulating ground, proved extremely fatiguing to our horses.—The space between the two ravines was formerly occupied with lofty forests; which has induced them to give it the name of *Pointe des grands Bois*, to a cape on the side of which a small crater is situated. Before it we discover two large volcanic rocks that had been separated from the land by the waves, and thus forming two barren islets that serve as a retreat to sea-fowl.

We experienced a degree of heat of which it is impossible to form any idea, before arriving at *Saint Pierre*, which we reached at noon. I had purposed to visit immediately a country whose aspect was so different from the other parts of the island; but it was first necessary to bestow some attention on my wounds, which I had hitherto too much neglected.

The slightest wounds in the inferior extremities, and in the neighbourhood of tendinous parts, are reputed to be very dangerous in the Isles of France and Bourbon. It was deemed expedient that I should remain during the greatest part of every day at perfect rest, and I employed this leisure in arranging the collections I had made since my departure from *Sainte Rose*. I wrote down my remarks; and examined as well as I was able, by the aid of a microscope, the marine productions which I sent my negroes to collect upon the reefs and along the shore.

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 CHAP. XVIII.

 EXCURSION TO THE PLAINE DES SABLES, BY THE PLAINE
DES CAFRES.

DURING my confinement I prepared every thing that was necessary for our great expedition to Salazes, a mountain which is regarded as nearly inaccessible. I dispatched a black on the evening of our departure, to the opposite side of the island, with a letter to M. Hubert, junr. in order to engage him or any of his friends who were disposed to join in our excursion, to meet us at the foot of the *Piton de Villers*.

We proceeded on horseback to dine with M. Nerac, a rich inhabitant to whom we had been introduced, and who lived about a league from the road we were to travel. We took with us only our own domestics: leaving the other blacks, after having assigned each his proper task, to set out next morning under the direction of Cochunard; who was to proceed to the *Piton de Villers* at noon, and plant a signal in order to direct M. Hubert in his way thither.

I have already said that Bourbon is composed of two lofty volcanic mountains; the one extinguished, and the other still burning. The intermediate ground uniting these mountains, is in a direct line from north-east to south-west, which we may suppose to be drawn from *Saint-Benoit* to *Saint-Pierre*: along this line the country is less elevated than either the *Salazes* or *Fournaise*, which form the two foci of the elipsis.

On two sides the soil is gently elevated from the sea towards two extremely singular platforms, named the *Plaine des Cafres* and the *Plaine des Palmistes*, situated between *Saint-Benoit* and *Saint-Pierre*.

A road called *de la Plaine* runs along the space of ground which unites the two mountains: thus forming a ready communication between the opposite sides of the island, which was formerly impracticable on account of the badness of the way, that frequently obliged the traveller to make a circuit of more than thirty leagues; whereas now by the longest route it is no more than fifteen from *Sainte-Suzanne* to *Sainte-Joseph*. We proceeded along the road of the plain, which ran through the grounds of M. Nerac, whose house is situated about a hundred and fifty toises above the level of the sea. This mansion is composed of small separate pavilions, which communicate with each other by

alleys of pomegranate-trees. M. Nerac had been informed of our intention to visit him, and received us with great magnificence. We could not, however, comply with his earnest intreaties to remain at his house, but promised to pay him a longer visit on returning from our excursion. He somewhat exaggerated the difficulties of our enterprize; and I frankly avowed that had I not been forewarned that he frequently had recourse to this polite stratagem to retain his guests, I should have been tempted, from his representations, to regard our projected expedition as utterly impracticable.

At an early hour in the morning of the 6th November we mounted our horses, and pursued the road along the plain; the declivity of which, though in general very gentle, proved extremely fatiguing to the horses, on account of the ravines we were obliged to cross being interspersed with eminences and descents, on which the poor animals with difficulty kept their footing. M. Dejean had furnished us with an additional guide, named *Germain Guichard*. This man was a dark-complexioned Creole, about sixty years of age, but still active and alert. He was nearly six feet high, and of an elegant form; his eyes were lively, and the hair of his head and beard white; his countenance beamed with an expression of frankness and candour which prepossessed in his favour every one who approached him. He had been the play-fellow of M. Hubert de Montfleury, whom he had not seen for twenty years; and he rejoiced exceedingly on meeting his son at the *Piton de Villers*.

In our way we visited the highest garden of M. Nerac; which is situated in an extensive wood, and sheltered on all sides.

On beholding peach-trees in blossom, borders of strawberry plants, beautiful artichokes, and several other of our leguminous vegetables, surrounded by a hedge intertwined with the *rubus** like that of our climate, I for a moment imagined myself in Europe. Several plants which abound in our kitchen-gardens likewise grew in the neighbourhood; as well as a *Physalis Peruviana* L., which is doubtless not indigenous to the island.

At the *ravine blanche*, which intersects the road we travelled, every sort of cultivation ceased. The nature of the vegetation with which the ground was covered became insensibly changed, and a great variety of European plants attested by their vigorous growth the luxuriance of the soil by which they were nourished.

The fruit of the strawberry which we here met with in such great abundance, is equal to that which grows on the Alps. M

* *Rubus tomentosus*, foliis septempinnatis, foliolis ovato-oblongis, acutis serratis, subtus tomentosis, albicantibus. N.

Lilet assured me that formerly there was not a single plant of this description in the whole island. His father and M. Com-merson, during their excursions, first planted some of their roots in the plain, where now they are so numerous as to tinge our limbs in crossing certain spots of this district.

We again found our blacks; who had left the river d'Abord in the morning, and were now reposing in an old ruined hut situated on the banks of the *Ravine des Cabris*. From hence it took us an hour to arrive at the *Piton de Villers*, which is six hundred toises above the level of the sea.

The *Piton des Villers* is nearly equidistant from *Saint Pierre* and *Saint-Benoit*. Palm-trees and a few stunted shrubs constitute the whole of its verdure. A ravine, the bed of which is not very deep, flows at its base: it is the arm of the *Ponteau*, which falls into the branch of the *Plaine*. The road, which is here only a kind of foot path, winds towards the left of the *Piton*.

We discovered an old camp at the base of the cone, and immediately set about putting it in a state of repair. Neither M. Hubert nor my black yet appeared; and while waiting for their arrival, I employed myself in viewing the environs. I ascended the *Piton des Villers* in hopes of descrying them at a distance. On arriving at the cone, which is not more than three hundred feet above the plain whence it originates, we distinguished what is termed the *Plaine des Cafres*. This spot, notwithstanding the name which has been given to it, is extremely unequal, being formed of a number of small platforms rising gradually one above the other. It is bounded to the north-east by the *Plaine des Palmistes*, and by the summits of the declivities which descend towards *Sainte-Rose*; to the east by the *Plaine de Cilaos*, and by the embankments of the river of *Remparts*. The eminences of *Saint-Joseph* and *Saint-Pierre*, and the *pitons* which we discovered before arriving at *Coteau-Maigre*, terminate this *plaine* in a semi-circle stretching from the south to the north-west. The height of the lowest platform is six hundred toises above the level of the sea. The name of *Plaine des Cafres* seems to be derived from a horde of *Maroons* who inhabited it; and who frequently descended with a view of pillaging the plantations, by the ravine which still bears their name, and which we crossed near the sea-shore.

The cold is extremely intense on the *Plaine des Cafres*. We had been cautioned respecting the danger of exposing ourselves when in a state of perspiration to the cold winds which frequently prevail here; and were soon convinced of the propriety of this advice, by observing the bones of several animals, as well as

some unfortunate blacks, who had perished when seeking shelter from the cold, in some hollows along the road.

The greatest elevation of the *Plaine des Palmistes* is about four hundred and fifty toises. Its name is derived from the great number of palm-trees which grow upon its surface. It is a singular circumstance, that when the air is perfectly calm, the leaves of these trees are uniformly directed towards the centre of the island. On mentioning this circumstance to M. Hubert, he assured me he had remarked the same phenomenon. Can it be occasioned by the attraction of the central mountains?

We now became anxious for the appearance of M. Hubert: Had he received my letter? Was my servant returned? The sun, about to descend below the horizon, darted its departing rays through some reddish vapours. What could have prevented the return of George? Had he abandoned us, to seek among the numerous Maroons who inhabit the most inaccessible places, an useless and uncertain liberty? At this moment all the accidents I had heard at any time related rushed on my memory, and I represented to myself George as having fallen a victim to the intense cold of these regions: perhaps even now his body was extended near us.

We approached the flag which had been displayed in the morning; when, at an angle in the road between the Piton de Villers and the Piton Desmenil, we discovered the black for whom I had experienced so much anxiety. He had been detained some time by M. Hubert, from whom he brought me a letter, wherein I was informed that affairs of importance required his presence during the whole week at *Saint Benoit*; he would repair to the place I had indicated, at which time we should likewise be joined by MM. Patu de Rosemond and Lelgenti.

The thermometer, which during the whole day had not risen above 15° , had fallen to 12° when I entered the camp after sunset. The weather was moist, cold, and gloomy. We hesitated whether to proceed the next day to the *Salazesi*; or return to the house of M. Nerac, and there wait for the arrival of those friends who intended to join us. The appearance of the horizon soon fixed our determination. Cochinard, having gone out of the camp during the night, returned to inform us that from the side of the volcano he distinguished an extraordinary light, such as he had never before observed. In fact, all that part of the heavens appeared as if on fire: the atmosphere, gleaming with red lights, resembled the mouth of a furnace; clouds penetrating these lights, seemed suspended between the flames; and an uncertain glare mingled itself with the darkness of the mountains; without dissipating the obscurity. Let us proceed to view

the volcano on this side, cried Jouvancourt: this was also the advice of M. Dejean.

We slept ill; being greatly incommoded by the intense cold, notwithstanding our fires and the warm clothes in which we were wrapt up. The thermometer stood during the whole night at 5° above zero; at sun-rise it mounted to 11½°.

On the 17th November I sent George to inform young M. Hubert that I would wait for his arrival in the neighbourhood of the camp of Piton. I entreated him to assure MM. Patu and Lelgenti, how much pleasure it would give me to pursue the journey to Salazes in their company.—We left our camp at six o'clock, and for some time pursued our way in the bed of the *Bras de Ponteau*. This ravine has no embankment for a great part of its course, its beds being full of holes and cavities. We always found in them a sufficient supply of fresh water.

Besides the plants scattered over the rest of the plain, I observed in the *Bras de Ponteau* two beautiful species of *Conyza**, and a plant termed in the island *bois cassant*†; as well as the *lobelia heterophylla*, which I had formerly seen not only on the sea-shore, but likewise at the height of six hundred toises, though I never was able to discover it in any of the intermediate regions.

We left to the right a beautiful eminence, the summit of which appeared truncated at a great distance: it had been the mouth of a volcano; which we termed *piton Guichard*, from the name of our brave guide, who, having made us quit the ravine, conducted us across a beautiful plain winding round some little hillocks. This place, like the rest of the *Plaine des Cafres*, would afford an excellent situation for raising flocks, as they would here find an alpine temperature and abundant pasture.—Having reached the height of seven hundred toises above the level of the sea, we now found ourselves between two considerable eminences. Upon the side of that which we left to the right, I distinguished the limb of a large crater, which we had before perceived from the road of the *plaine*. I found on examination that it was from forty to fifty toises in diameter, and between eighty and a hundred feet deep. During rainy weather it is converted into a species of lake, and tufts of gramineous plants grow at the bottom after the waters are dried up.

This place was formerly visited by Commerson; who was

* *Conyza pinnifolia* glabra, foliis linearibus, acutis; floribus corymbosis. N.

Conyza callocephala foliis ovato-oblongis, subspatulatis, sessilibus, villosis; floribus solitariis, terminalibus, longe pedunculatis. N.

† *Peathura*, Juss.

forcibly struck with the vicissitudes of things, and the power of time in thus converting a flaming spiracle into a basin of water. He bathed himself in this water, and delighted to repeat that he had swum in a volcano. I gave the name of this indefatigable naturalist to the mountain in question: which was however already named *Morne des feux à Mauzac*; from Mauzac, a Maroon chief who formerly inhabited the crater, and kept upon the most elevated part of the *piton* a sentinel who lighted fires as a rallying signal for his companions.

We soon reached the *plaine de Cilaos*, which commences near the source of the river of Remparts. Its name is derived from a famous Maroon who wandered about a long time; and who, having been pursued by the hunters was surrounded in the basin of the river of *Saint-Etienne*, where he was killed near a small waterfall that still bears his name. The soil of this platform is more wretched and barren than any we had yet seen, being wholly composed of half-decomposed fragments of lava. Some plants and a few *ambavilles* seem to grow as it were with regret on its surface.

The embankment on our right was formed of reddish strata broken and unequal: the *piton* towards its summit is equally red. One of the sides of the river of Remparts terminated the prospect. Its base might be said to rest on the platform; and it appeared to be on a level with the place where we stood, but on a nearer view we perceived a hollow more than a quarter of a league in breadth.—Upon the summit of the rampart towards which we directed our steps is a crater somewhat inclined, of a regular form, and which very much resembled the central crater of the volcano. More to the right we observed an opening of a very extraordinary figure, which had every appearance of having been also a crater; and a few toises above it, we discovered an oval hole filled up with scorix, which greatly resembled an old window. To reach this place, which to us was extremely desirable, we were forced to pursue a long and fatiguing course across the eminences which lay towards the left, after which it was still necessary to traverse a kind of valley. This valley or plain communicated on one side with the source of East river, and on the other with the river of *Remparts*; so that we stood on the intermediate spot between two immense torrents, which seem to have proceeded from the same origin.

The heat was here extremely suffocating: not a breath of wind tempered the atmosphere. Among the small number of plants we met with, I did not observe one I had not seen before. In a word, we had reached a part of the road which was extremely fatiguing and disagreeable. I myself took the lead; when suddenly about fifty paces before me I

observed a white goat, which, gamboling here and there, seemed to be instructing two young kids that followed her. Being so near her, I flattered myself with securing an increase of provisions. Cochinard and Guichard had observed her nearly about the same time, and each of us pressed forward to fire his musket: but the place being open, the animal observed us; and setting up a cry fled, followed by her young, with the greatest precipitation. While running along the plain, we despaired not of reaching her; but at the very moment when I was prepared to fire, she gained the edge of a precipice, upon the sides of which she disappeared like lightning. This precipice forms the origin of the river of Remparts, the mouth of which we formerly visited. While I was admiring its immensity, the shrill cries of other wild goats resounded from all sides.

On reaching a further height, we perceived the crater next to the opening of which I have spoken. From the appearance of the lava, and other circumstances, we were almost inclined to believe ourselves on the summit of a burning mountain; and the resemblance became more striking on arriving at the edge of the most extensive crater in the island, and to which I have seen nothing comparable in all the descriptions that have been given of volcanic countries.

I called this mouth, on the brink of which we now stood, *Crater Commerson*, and the beautiful small one in its vicinity *Du Petit-Thouars*; thus consecrating the names of two celebrated naturalists who had visited this place at different periods.

From the crater *Du Petit-Thouars* proceeds a ravine, in the holes of which we found water. This ravine is named *Bras-caron*, and supplies with water several small cascades which we observed at a distance upon the banks of the river.

At between nine hundred and a thousand toises above the level of the sea, we reached a plain composed chiefly of old disjointed lava, which presented numerous asperities. Here every vestige of vegetation ceased: we skirted the river; and after passing between two small eminences, arrived about four o'clock at the place where we had determined to pass the night.

At sun-set the thermometer stood at $12\frac{1}{2}^{\circ}$.

The land wind springing up, dispersed the vapours which surrounded us, and drove them towards the sea.

At midnight the thermometer indicated 8° . The temperature here did not appear so cold as that we had experienced on the *Piton de Villers*. At daybreak the thermometer stood at 3° : at sunrise it ascended to seven; and when we departed a short time afterwards it had reached $8\frac{1}{2}^{\circ}$.

On leaving the cavern *à Cotte*, where we had passed the

night, we proceeded towards the east by a kind of plain, broken and unequal in its surface; the soil, which was composed of fragments of different kinds of lava, being extremely parched and barren. We soon reached an eminence from which we overlooked the *Plaine des Sables*.

The descent to this plain was not very difficult. The rampart we had descended is in the form of a cross, and from two to five hundred feet in height: it forms a continuation of the ridge of the *Morne de Langevin*; which, after making a bend, joins with the rampart of *East river*.

This chain of ramparts divides the island into two parts for about the length of seven leagues, in a direction from north-east to south-south-west.

The rampart of the *Plaine des Sables*, elevated eleven hundred toises above the level of the sea, is composed of strata of compact lava, formed in many places into elegant prismatic colonades, resembling in colour and disposition those I examined near the crater Commerson.

In travelling over the *Plaine des Sables*, we found it necessary to walk with our feet naked, because the gravel which otherwise enters through the shoes proves extremely incommodious. This gravel is composed of different kinds of lava, forming a bed more or less thick; and the action of water, friction, the impulse of the winds, which roll and accumulate it in different directions, especially at the foot of the rampart, contribute to reduce it into very minute particles.

We skirted the rampart toward the south, in order to visit the origin of the torrent *Langevin*, which we very soon reached. The lava which forms the bed of this torrent is precisely similar to that of *Brûlé du Baril*, situated at the base of the mountain whose different summits we traversed: these two streams are doubtless prepared in the same focus, analogous in their nature, and in the direction they have followed at different heights. This circumstance besides offers a further proof that the action of subterranean fires is not wholly confined to the summit of volcanoes, since the source of the *Brûlé du Baril* is not more than twenty toises above the level of the sea.

CHAP. XIX.

SECOND EXCURSION TO THE SUMMIT OF THE VOLCANO.

November 1802.

WHEN night had spread her sable mantle over these solitary regions, and when the vapours hovering on the mountains were precipitated towards the shores of the ocean through the ST. VINCENT.]

great *Pays Brûlé*, a new light seemed to replace that of the sun, which had disappeared; but this, instead of enlivening the scene only served to add greater horror to the silence in which every thing was involved. The clouds of smoke which had appeared to us during the day to rise from the crater, now seemed like a pillar of fire rising to a great height. At the summit of this column were formed thick clouds moving in different directions, beautifully illuminated with streaks of fire very similar to those which during the dog-days frequently conceal the setting sun from our view.

Columns of liquid matter were ejected in rapid succession from the sides of the crater. While listening attentively, we heard as it were a hollow rumbling noise; or rather a sound resembling that produced by a great water fall at a considerable distance. About eight o'clock at night there issued forth at a small break, within which we stood, a fiery rivulet, which shortly afterwards separated into three branches. These continued to flow with an almost inconceivable rapidity till the moment I fell asleep. I viewed for a long time through a telescope these billowy streams of lava: they dragged along, with a prodigious noise, large masses of scorïæ, nearly in the same manner as the waves of an impetuous torrent tear away and impel forward the rocks which impede their passage.

I got up on awaking at midnight, to observe the thermometer: it stood at 5° , which appeared to me very high. The currents of lava had now slackened their course; they had not proceeded farther than two hundred toises, and already in several places appeared to have lost much of their brilliancy. Our fires having gone out, the cold, which was now very intense, again awakened me; and I found the thermometer had fallen to $2^{\circ}\frac{1}{2}$. As I was busy in rekindling the fire, on which I had thrown some twigs of heath, the mountain diffused an uncommon splendour. A hideous noise, frequently repeated, was followed by a multitude of grand and beautiful rockets of lava; which darting from the crater to the height of more than two hundred feet, bore some sort of resemblance to a girandole. Never did I witness a more striking spectacle. It ceased at the termination of a quarter of an hour. Immediately afterward another stream burst forth somewhat to the right of the first, and flowed with equal rapidity: at sun-rise its extremity had reached the small crater which we could distinguish on the side of the mountain, and from whence issued pillars of smoke. Suddenly the thermometer ascended to 4° , then to $4\frac{1}{2}$, and in a short time to 5° , 6° , and even $6\frac{1}{2}^{\circ}$ when the sun had fully ascended above the horizon.

On leaving the camp I beheld all the ground so much covered

with hoar-frost, as almost to induce me to suppose that snow had fallen during the night. I am far from being partial to the severe winters of our climates: but my feelings were on the present occasion by no means disagreeable; because the hoar-frost recalled to my mind the early days of our spring, when the mornings are still cold.

I was much surprised to find ice, which appeared to be an inch in thickness, upon spots of ground where the evening before I had not remarked the least trace of humidity: it cracked under the feet like snow of which the surface only is frozen. This stratum of ice was entirely composed of parallel threads like those of asbestos, or rather striated calcareous spar. The temperature of the air being during the night rather below zero, and consequently colder than the ground, the heat of the latter endeavouring to restore the equilibrium, escaped and carried off with it the aqueous particles with which it came into contact in its passage. In proportion as these particles presented themselves at the surface of the ground, they became congealed: and in this way, I think, may be explained the interesting phenomenon which fell under our observation. Henceforth travellers need be under no apprehensions on not finding water in these regions for the supply of their wants; as by collecting the ice thus produced in the morning, they can readily furnish themselves with a sufficiency of that essential article.

Having previously arranged every thing for our second excursion to the crater of Dolomieu, we set out on the 19th, at half past six in the morning, accompanied by only three blacks. The rest of our attendants we left behind in the camp. Jouvancourt, who had lately been much indisposed, did not accompany us, but remained behind with Cochinard; it was settled however that he should meet us on the following day, on the north side of the *Plaine des Sables*.

During our progress we visited a crater, the borders of which were indented, and lowest on the side overlooking the sea. There proceeded from it a slight sulphureous vapour; which ascending in a spiral form, tinged of a yellowish hue a part of one of its sides; the lively red colour of which, mingling with the dingy black of the gratons, formed irregular belts.

Black and red are in our theatres, our pictures, and the writings of our poets, the appropriate colours of demons and Furies. This idea is mythological, and is certainly borrowed from Italy: for Italy, filled with volcanoes, so much resembled the abodes of the infernal deities, that we have every reason to believe these burning mountains have been assumed as the prototype of the pagan Tartarus.

After encountering many difficulties, we reached about two

o'clock the lowest side of the crater Bory; of which we took a transient view, but did not perceive that it had undergone any change since our former visit. The thermometer, which at noon had stood at 19° , was now at 18° , and at four o'clock it descended to 15° . The weather was delightful; a gentle wind blew at intervals: the atmosphere however was overcast with a few clouds; which concealed from our sight a part of the sea, the *Piton Berth*, and the *Plaine des Sables*.

I discovered that neither rain nor high wind had occurred since our former journey to this place; for some pieces of torn paper which we had left behind us, a part of the soles of our old shoes, and a few grains of rice left from our repast, had neither been wetted nor carried away to any great distance from the place where we had halted.

It was determined that we should pass the night at the foot of the central crater, on the side which overlooks that of Dolomieu. We kept at a certain distance from this last; not being yet inured to its explosions, which were more terrific than those we had beheld in our former excursion.

The weather gradually became more delightful, but much colder. When the sun had set, not a cloud was visible; and the thermometer fell to 5° . We very clearly distinguished the *Piton-Rouge*, the *Nez Coupé*, *Table Point*, and the craters of Ramond. After it was perfectly dark, we perceived very distinctly a light near the spot where the house of M. Deschasseurs is situated, from which I had set out when I made my first excursion. Perhaps at this moment, thought I, M. Deschasseurs and his family are enjoying the fresh breeze on their terrace, while my companions and I are endeavouring to warm ourselves by the heat of volcanic fires. Doubtless the extraordinary light which the crater emitted, could not fail to attract the attention of those creoles; who were very far from suspecting that any of their acquaintances were within gunshot of the object that excited their admiration and terror. On the opposite side, the fire and smoke of the camp where we had left M. Jouvancourt were perceivable through the gloom of these wild solitudes.

According to our previous agreement with my friend, I hoisted a blanket as a flag; which, he told us on the following morning, could readily be seen even at that distance, by means of the vivid light which surrounded us. We afterwards fired two muskets; but so considerable an interval elapsed before we heard any return, that I no longer expected it; when one of my my attendants assured me he had distinctly heard another report, and in fact a long time afterwards we were sensible of an explosion very distinguishable from the noise produced by the mountain. By means of a very accurate watch,

I measured the interval that elapsed between the flash and the report; in order to verify the exact distance of the central crater from the *Piton Berth*.

The light by which we were surrounded was so extremely vivid, and the cold so very piercing, that none of us could fall asleep. Near midnight the thermometer, sheltered from the influence of the crater, stood at two below the point of congelation. Not being able to support this extreme degree of cold, I took the resolution of approaching the burning mouth of the volcano till the thermometer marked 15° . Two of my blacks, who were more sensible of the cold than myself, advanced still nearer. Having then wrapt myself up in a cloak, I stretched myself upon the lava, and slept profoundly.

The cold, which had greatly increased before sun-rise, at last roused me from my slumbers. I did not, however, find the thermometer so low as I expected, which doubtless proceeded from the heat of the volcano: it marked 3° below zero; scarcely however had the sun, when it ascended to $5\frac{1}{2}^{\circ}$ above.

Before bidding a last adieu to the spot where we had experienced so genial a warmth during the night, I wished to approach as near as possible the mouth of the crater. Accompanied by a single black, and with the thermometer in my hand, I advanced towards the chasm which lay in my way, and from which issued copious white vapours. While I continued to advance with caution, I endeavoured to ascertain whether these vapours might not be productive of suffocation, and prove an insurmountable barrier to my design. These fumes, which were extremely hot, exhaled only a slight sulphureous odour. The thermometer which I held in my hand, rose in two minutes to 23° . I soon withdrew it, as the heat produced a singular and painful sensation over all my arm; the instrument was covered with drops of water, which upon tasting I found to be saline and acid. Having passed over the first chasm or fissure, I met with several others which lay directly before me; these however did not interrupt my progress, but my black betrayed evident signs of fear. Giving him therefore my cloak, which I found inconvenient, I advanced a little nearer to the crater, and threw a stone into it. Though I experienced a very great degree of heat, yet as this seemed more particularly to proceed from one side of the crater, I am persuaded I might have approached it nearer in a different direction, had not an accidental gust of wind driven the sulphureous vapours directly against our faces, and nearly suffocated us. The degree of heat at this moment was so insupportable, that I had no alternative but immediately to follow the example of my black, who had taken flight and carried with him my thermometer. The poor fellow, who steadily kept his eyes fixed on me, had been the first to remark the impulse

given to the vapours by the wind, and when I rejoined him was almost convulsed with terror. He pointed out to me that the long hairs of the stuff of which my cloak was made, were crisped like an animal substance exposed to the influence of too much heat.

Previous to setting out on our return, we enjoyed one of the most magnificent prospects imaginable, which extended over all the eminences in the island; but which, during our former journey to this place, the fogs had concealed from our view.

After admiring the grand scene before us for some time, we began to descend on the opposite side of the volcano. Here the declivities were less abrupt, and the lava more compact: we met with no scorixæ in our progress; and the road was so commodious, that Dejan and I proceeded at a very quick pace. At the end of half an hour we reached the base of the dome and the commencement of the platform, which we had yet to cross in order to arrive at the *Rempart de l'Enclos*.

After a fatiguing walk along this rampart, we rejoined Jouvancourt and the rest of our companions whom we had left behind us. I found Jouvancourt extremely ill: he had passed a sleepless night, and been very feverish; his head was much swelled. He informed me that the cold so sensibly felt on the former night, had been still more severe during the last at the *Piton de Berth*; that notwithstanding they had kept up a constant fire, he had greatly suffered from it; and that when he took his departure in the morning, the ground in the environs was covered with hoarfrost, and a stratum of ice still thicker than that observed by us on the preceding evening.

Cochinard, who had not slept, told me that he had very plainly distinguished the flag I hoisted on the borders of the crater, and distinctly heard our firing: he even saw us set out at sun-rise. At three in the morning he had likewise seen ejected from the crater Dolomieu a finer stream of lava than that we had witnessed on the foregoing evening; to which I conceive, was attributable the tranquil state of the volcano when I awoke.

After halting to breakfast we again set out, but the fog was so thick that we could scarcely see any object beyond the distance of a few feet. Great difficulties were experienced by us in our progress: we were obliged alternately to climb up and descend from one ravine to another.

In our doubts we frequently turned back and went to the right, when we should have proceeded towards the left. Jouvancourt's fate was particularly hard: he laboured under a fresh exacerbation of fever; and two clokes were scarcely sufficient to protect him from the weather, which was very cold and moist. At noon the thermometer stood at only 9° above zero.

At length, after much wandering, we succeeded in finding an excellent shelter in a grotto termed the *Caverne à Cotte*. From the exhausted state in which I felt myself, this cavern seemed to me a real palace. The weather was somewhat milder: I ate sparingly; and having thrown myself on a heap of dry heath I soon fell asleep, and did not wake till the following morning.

Jouvancourt, who had passed a very restless night, roused us all by day-light, being anxious to reach the river d'Abord in order to recover his health. We therefore set out as soon as the sun began to gild the summits of the *Salazes*, which were in sight of our grotto. The fog had completely disappeared; the weather was temperate, and the atmosphere without a cloud.

Upon the *Ambavilles* near our station, I discovered two insects that I had not hitherto seen: the one belonged to the genus *Lucanus**, and the other to that of *Ichneumon*. They were both black: the first was of the size of the blue stag, *Lucanus caraboides* Fabr. and its elytra were striated; the second had a white ring at each antenna.

It was nearly three o'clock when we arrived at the Piton de Villers, where we halted about two hours. The strawberries which abounded in the neighbourhood of this place, afforded me a delicious repast, and quickly obliterated the remembrance of the fatigues we had lately undergone; and each of us assuming fresh courage, we proceeded on our journey towards the house of M. Nerac. It was half past eight when we arrived at his habitation, but he had already retired to rest. His people however gave us a hearty welcome; prepared us a good supper; and supplied us with water to wash the feet, and comfortable beds—luxuries to which we had not been accustomed for some time.

Dejean, one of our companions, in consequence of having neglected a wound he had received in his foot during the first day of our journey, was forced to relinquish the design of accompanying us to the *Salazes*, and to proceed with Jouvancourt. I spent the whole day by myself at M. Nerac's, in order to arrange my journal and collections.

CHAP. XX.

EXCURSION TO THE PITON DES NEIGES.

November 1802.

BEING apprehensive that young Hubert and his companions would arrive before me at the *Piton de Villers*, and might

* Probably the *Lucanus Triatus*. Fabr.

be uneasy at not finding me there, I sent off my blacks on the 24th of November at day-break, retaining only my own servant Alexander.

M. Nerac politely insisted on being my purveyor on this occasion; and so amply supplied the negroes with provisions and liquors of every kind, that they were actually overloaded: but they made no complaints, because they were certain of participating in the good cheer.

At my departure the horizon became gloomy, and the sky was overcast. My host advised me to postpone my journey till the ensuing day; but notwithstanding the rain, which began to fall at two o'clock, I mounted my horse, and proceeded on my way to the plain of Cafres.

Except in one other excursion, I was never so completely wetted as on this occasion. During the whole day it rained incessantly. In a little more than two hours, I overtook my people at the ravine *des Cabris*, where the bad weather had forced them to seek shelter in a half-ruined hut. I immediately caused it to be repaired as well as possible, and determined to stop in it during the night.

Germain Guichard waited the return of day with great impatience; as he was anxious to proceed to the camp at the *Piton de Villers* in order to see young Hubert. He awoke me at a very early hour: and we immediately set out; after taking, according to our usual custom, a few cups of coffee. I was scarcely on horseback when my messenger returned, bringing with him a letter from young Hubert inclosing another from his uncle, acknowledging the receipt of one I had written him from Saint Benoit. "I was really anxious about you, my dear friend," said the worthy old man; "for I was apprized of your determination to scale the volcano on the side next the sea. I can scarcely believe what I heard concerning the accomplishment of such a design: but your letter has convinced me, no less than the relation of your man George; who particularly remembers that you continued a whole day without drinking, and two days with scarcely any food. I pity the servants of such enthusiastic naturalists as you. In fact, you travel as the French make war; I mean, like those deterred by no obstacle, and who banish the word *impossible* from their language."

We hastened forward with as much speed as possible; and soon reached the place of rendezvous, where Hubert and Gentil waited our arrival with much anxiety. They were attended by four negroes loaded with provisions of all kinds, and three creole hunters; one of whom, called Jean Duguin, was perfectly acquainted with almost every sequestered spot in the island. He had resided thirteen years in this desert, living like a maroon far

from the haunts of men. This creole, who was of a very dark complexion and extremely thin, had a wildness in his appearance, and displayed in his looks a singular expression of frankness; added to which, his eyebrows, his beard, and white hair, gave an air of great majesty to his whole person. After sending away my baggage to the river d'Abord, and partaking of a hearty breakfast, we immediately set forward. The weather was delightful. In order to arrive at the *Piton des Neiges*, which in a clear day can be readily seen from the plain, *des Cafres*, we left the road which traverses the plain, and proceeded in a western direction. During our progress we frequently observed the *Lichen rangiferinus* L. the *Lichen caninus* L. as well as many other cryptogamous plants common to Europe. We likewise discovered a species of *Lichen* which, as far as I know, has not hitherto been described: I have termed it the *Lichen giganteus**. It is the largest of the fruticulous division of this numerous family, and in habit and aspect approaches to the *Rangiferinus*; but it is much larger; is of a whiter grey; and its branches, instead of nodding, are separated into small dichotomous or trichotomous divisions, forked at the extremities. I remarked several kinds of mushrooms growing on rotten trunks and dead branches of trees; besides several species peculiar to the climate, there were others similar to those of Europe, such as the *Tremella glandulosa* Bul. &c.

Among the solitudes we traversed, many open spaces like savannas served to bring to our recollection the smiling meadows of our own country. These spots might be easily rendered very productive, if any individuals possessed the spirit to eradicate the moss and underwood with which they are covered. I am thoroughly persuaded, that many of the grasses of our temperate climates, would be found to thrive and enrich with pasturage a country, whereas yet they know not the use of hay, and are wholly unacquainted with the mode of rearing sheep.

Proceeding in the same direction we crossed a deep ravine, in one of the sides of which there was a commodious grotto called the *cavern of Jean Duguin*. It obtained this name from the father of our travelling companion, well known as an intrepid hunter, who was accustomed to reside in it during his excursions into this part of the island.

As it was my wish to enjoy the prospect round me, I proposed to my companions that we should halt here for the night, more especially as the mist began to set in very thick, and not attempt to traverse the celebrated *Coteau Maigre* till the following morning. My advice, however, was unhappily overruled.

* *Lichen giganteus*, tubulosus, ramosus; caule subrugoso; ramis dichotomis trichotomisve, extremitate furcatis. N.

We skirted the sides of a rampart, the base of which the clouds hid from our sight. We heard the water at a distance, rushing like a torrent beneath our feet.

The *Bras de la Plaine* which I was prevented from visiting, is one of the most singular torrents in the whole island. It empties itself into the river of *Saint Etienne*, about three leagues from the sea, where it is received into a particular kind of bason.

All the waters that take their rise on the western side of the plain of *Cafres*, as well as upon that which is termed *Entredeux*, run into it. The *Bras de Ponteau*, the direction of which we pursued in proceeding towards the volcano, greatly augments the *Bras de la Plaine*.

Entredeux constitutes a chain of steril, abrupt, angular, and fantastically shaped mountains; which stretch nearly in a direction from the north-east to the south-west, and separate the bed of the *Bras de la Plaine* from the magnificent bason of the river of *Saint Etienne*. The *Entredeux* is connected on that side where its summits are most lofty, to the *Coteau Maigre*; where its height is nearly a thousand toises above the level of the sea. Its summits exhibit a diversity of hollows and pyramidal points: its sides are wholly destitute of verdure, so as to enable us easily to distinguish that the whole chain is composed of beds of lava heaped up.

The bed of the *Bras de la Plaine* is bounded by very high banks, the sides of which present a beautiful series of regular basaltic prisms. They did not, however, so much attract my attention as the bason of the *Chites*, which lay at our feet. Two branches or ravines which enter into it, are separated by a rampart which terminates in so acute an angle, that under a certain point of view it may be taken for a pyramid, of an altitude at least triple that of the highest pyramid of Egypt.

Rain now began to fall, and the cold became extremely intense; when Guichard, who preceded us, suddenly exclaimed "There is the *Coteau Maigre*."

The *coteau maigre* is considered by the colonists as almost impassable. Such a frightful description had been given me of it, that unless circumstances had occurred to render it nearly fatal to some of our party, I should have believed it hyperbolic.

The thick fogs by which we were surrounded, prevented me from forming any judgment as to its height above the plain on which it stands. In the direction which we pursued, the passage was extremely difficult: we were alternately forced to proceed to the right and left of the immense and amorphous masses of rocks which compose its summit. We constantly beheld at our feet, either fearful precipices, or clouds still more dreadful from the idea of the yawning gulfs which their appearance suggested.

Sometimes we were compelled to climb almost perpendicularly; or suddenly to descend through narrow passages, on which we seldom found any shrubs to catch at. It occasionally happens, but happily we did not learn it by experience, that the stones to which travellers cling, or trust the weight of their body, loosen and give way, dragging along with them the unfortunate victims who confide in their stability. The name of *De bouldis* has been given to these falling rocks; which frequently deprive the declivities down which they are precipitated of every trace of verdure, and occasion a horrid noise which is dreadfully reverberated by the mountains.

Rains gradually furrow and destroy the *Coteau Maigre*, as if to display under our eyes the manner in which they act. The bad weather redoubled in proportion as we penetrated towards the ridge, which the moisture had rendered extremely slippery. Wetted with rain and chilled by cold, we had to struggle against numerous obstacles. Our blacks were so much loaded, and forced to employ so many precautions against accidents, that nearly two hours elapsed before they could extricate themselves from all danger.

When about to leave the *Coteau Maigre*, we began to reflect that it would be impossible to arrive before night at the cavern where it was our design to halt, and that we ran the risk of being obliged to sleep in the open air during the most dismal weather imaginable. This induced us to stop in order to collect our stragglers, and afterwards proceed in a body.

Though the violence of the rain greatly increased, the fog still continued. Our people came in one after another shivering with cold; which was the more sensibly felt, by their being almost naked, and inured to the warm temperature of the plains.

One of them however did not arrive: this was my own servant Alexander. We in vain waited for him upwards of an hour: often did Guichard call him with the voice of a Stentor; no return was made to his cries, except by the echoes of his own voice, which proved to us that it could be heard at a great distance, and that Alexander would have replied to it if some accident had not befallen him. Our distress was the more painful when we reflected that if the cold had benumbed and rendered him torpid, it would be impossible to kindle a fire to restore his animation, since the trees were so saturated with moisture that they would not burn.

Guichard and Cochinard immediately turned back, extremely terrified lest they should find Alexander lifeless, or not find him at all. I instantly sent Jean Duguin and his creoles forward to the grotto with orders to find, if possible, dry wood, in order to light

a fire in case of any accident. As for ourselves, exposed to the inclemency of the weather and involved in a thick mist, we remained shivering with cold and overcome with fatigue on the same spot, anxiously waiting the event. It was during this moment of painful suspense that I discovered with horror, on stirring some mosses, a human skeleton. The gloomy reflections suggested by this spectacle, and the influence of the cold which contributed to augment our inaction, determined us to advance a few steps. Being however without guides, and wholly ignorant of our situation, we found ourselves under the necessity of halting till we should learn what had become of our unfortunate domestic. The place where we stopped was a marshy spot full of long and thick grass, and in some parts of which the water had accumulated to the depth of several inches.

In a short time we distinctly heard Guichard calling out for help; and entreating us to send one of the stoutest of our negroes to assist in carrying Alexander, whom Cochinar had found lying stretched upon the brink of a dreadful precipice without any signs of life. Scarcely had we complied with Guichard's request when Casimir, a robust Cafre, fell apparently lifeless at our feet. So benumbed was he with the intense cold, that he became speechless, and could not utter a complaint: his limbs too were contracted, and had entirely lost their flexibility.

Exercise was the only remedy we could employ; and in our situation, which every thing combined to render so distressing, we had the melancholy prospect of seeing perish before our eyes the unfortunate beings whom we had induced to accompany us into these wild and dreary regions.

We raised Casimir; and while waiting for Alexander, took the resolution of compelling all our people to make some exertions. We exhibited a truly singular spectacle. Gentil, whose sad and melancholy air seemed to reproach Hubert and myself for the gaiety we assumed in order to encourage our blacks, dragged Casimir along by the arm, shivering and quite stiff with cold; while Hubert, alternately gay and sad, pushed him forward. Compelled to assume a necessary severity, I followed in the rear with a stick in my hand: forcing to proceed before me like a flock of sheep the five other negroes who had remained with me in the Savanna; and who, unless they had been compelled to move, would have fallen victims to the cold by yielding to the torpidity they began to experience.

We wandered in this manner during three quarters of an hour, up to the ancles in water, and were frequently obliged to turn back. Several times I was tempted to seize the pencil in order to depict the scene in which I was a sorrowful actor; but the incessant rain did not permit me a single moment to open the

case containing my papers and apparatus: my fingers besides were very much swelled.

In a short time we distinguished through the mist Guichard and Cochard alternately carrying Alexander, whom they had succeeded in rousing from his profound lethargy. Dripping with water and mud, they added a third group to the picture.

On extricating ourselves from a place where we had suffered so much anxiety, Le Gentil, heaving a deep sigh, bestowed upon it the appellation of the *Savanna of Misfortunes*.

Guichard found it so extremely difficult to distinguish his way, from the thickness of the mist, through these pathless deserts, that nearly an hour elapsed after leaving the Savanna before we reached the grotto, where it was our intention to pass the night. This grotto is situated on a declivity extremely steep and slippery, and we spent half an hour in descending to it.

The influence of a blazing fire and friction with ardent spirits very soon restored the sense of feeling to our poor benumbed blacks. Every one dried himself as well as he was able; and, yielding to fatigue, quickly resigned himself to sleep.

The fogs, far from being dissipated, continued to increase. Towards the middle of the night I flattered myself with the prospect of a delightful day. At sun-rise we could discern the summit of the *Piton des Neiges*, which was the object of our journey: but very soon new clouds accumulating from all quarters, obliged us to remain in the grotto during the whole of the 25th. Happily the most circumscribed spots in a country so little known to naturalists, create the greatest interest in the mind of a scientific traveller. Among several other rare plants growing on the sides of the cavern, I particularly remarked an *Acrostichum* and a species of *Bartramia* very much resembling that known in Europe.

The fogs disappeared on the approach of night, and the stars twinkled in the firmament as in our winter. The cold was extremely intense, and awakened me several times during the course of the night. At six in the morning we quitted the grotto; and pursuing our way across a savanna similar to that we had traversed in the evening, soon arrived at the bason of the river of *Saint Etienne*. This is circumscribed by prodigious high ramparts: among which the sides of the *Brûlé de Saint Paul*, and the interior declivities of the *Gros Morne*, are the most remarkable. The bason is about three leagues from north to south, and two from east to west.

We continued to ascend; skirting a tremendous high rampart full of extensive and deep parallel chasms, by means of which the bason of the river was constantly increased. We sometimes found it necessary to climb over enormous blocks of lava,

The village of *Saint Pierre* covers a considerable surface of ground, on account of the empty spaces between the houses; which, as well as the magazines, are constructed of wood. They are well built, and several are of the height of two stories. The date is the only tree which grows in the vicinity of this place, where the heat is excessive. From the nakedness of the ground, the extreme heat, and the dazzling brightness of the sun, (rarely intercepted by a cloud), we could almost have supposed ourselves transported into Arabia, or the centre of Africa.

In this neighbourhood they cultivate much cotton, which is of an excellent quality. Formerly it constituted the principal revenue of the country: but since the commencement of the revolutionary war colonial productions have lost much of their value; while that of provisions having increased, the inhabitants now turn their attention much more than formerly to the cultivation of grain.

The wheat raised near the river d'Abord is extremely beautiful, and of an excellent quality. The crops being likewise very abundant, they usually transport two-thirds of the produce to the Isle of France; which, being less fertile and more encumbered by forests, is not so susceptible of culture. This likewise is, in some measure the case with the island of Madagascar, from which the merchants of the north-west port import considerable quantities of rice and black cattle.

The shore of the district of *Saint Pierre* is almost wholly covered with calcareous fragments, among which we recognised many remains of marine animals.

Before the *Quartier* is a kind of platform; on which are constructed the huts of the negroes, and several windmills. The principal plants which I found in this place, besides a few species of grapes, were the *Datura tatula* L. and *Cactus coccinlifer* L.

A bank of volcanic reefs stretches for about half a league above the mouth of the river d'Abord. At nine in the evening, when the day began to decline, I visited this spot, and determined to dedicate fifteen days to examine the coast; but a letter which was brought to me by express during my stay with M. Dejean, made me suddenly change my determination.

The *Prince*, a vessel belonging to the East India company, had some time before sailed from Bengal, having on board a great number of French prisoners who had been exchanged or liberated on their parole. Although the *Prince* was under convoy of a ship of war which always kept within gun-shot of her, the prisoners nevertheless contrived to rise upon the crew, and at last succeeded in bringing her safe into the Isle of France.

The cargo being sold, and the vessel condemned for the use

of government, it was determined that she should be armed and sent home to Europe with those individuals who had long waited in eager expectation of returning to the mother country. Most of those who had disembarked from the *Geographe* and *Naturaliste* were in this situation; and M. Capmartin, who remained at *Saint-Denis*, wrote to inquire whether I was disposed to profit by the departure of the *Prince*.

When an ill state of health obliged me to quit the expedition, I conceived for some time that I should never again revisit my native country. Besides my bodily ailments, I also laboured under great mental agitation. Instructed in a knowledge of the sciences by an enlightened parent, I had been torn from these peaceful occupations by the revolution, and forced to enter the army. Being thus placed in the ranks, and convinced there was no escape, I obtained a commission, and henceforth dedicated all my attention to military tactics.

When the expedition was about to depart from France, peace was daily expected to take place, and I conceived I could not employ my time more usefully than by accompanying it; I had besides the promise of the minister, that on my return I should be permitted to re-enter the army, and that the time I spent with the expedition should be reckoned as service performed at sea.

Confident that I deserved not the least reproach for having abandoned the enterprize if every thing was fully considered, I had nevertheless strong reasons for supposing that none of those who had quitted M. Baudin had been more calumniated to the government than myself. I feared I should not be again employed on my return; and to increase my chagrin, I understood that war had again broken out, and that the French armies had effaced by new and more brilliant victories the glory even of their former exploits.

Fearing that my military career was at an end, I resolved to undertake a long voyage in order to increase my knowledge in natural history, and console myself for my disappointment. I determined first to explore Madagascar, afterwards to visit India and the Asiatic Isles, and then to return to Europe by the way of Africa, into the interior of which country I was determined to penetrate, or to perish in the attempt. Such were my projects, and such perhaps they may continue to be when France shall have forced her enemies to grant her a permanent and a glorious peace.

At the termination of eighteen months a ray of hope penetrated through the gloom that oppressed me, and re-kindled the desire of once more beholding my native country. General Magallon de la Morliere, who had received me with the greatest attention, and under whom I served in the Isle of France,

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wrote to inform me of the capture of the Prince, and his intention of sending her to Europe. He not only offered me my passage on board this vessel, but flattered me with the hope of a glorious combat during our passage, which would enable me to appear in an advantageous point of view to those at the head of administration. "Do not despair," said he to me, "my dear Saint Vincent; the present government will render justice to every one, and a brave man ought not to renounce his country as you have done."

After the receipt of this letter, I thought only of returning to France, and instantly set about arranging the collections I had made since my departure from *Saint Benoit*. M. Dejean was so obliging as to take charge of them, in order that they might be forwarded to the Isle of France by the first ship which should depart for that place from the river d'Abord.

I left the *Quartier of Saint Pierre* on the 1st December at 7 o'clock in the morning; having previously sent forward my blacks under the direction of Cochinard, as we intended to sleep at *Saint-Paul*, which is distant nearly ten leagues.

Mounted upon the horses M. Dejean had lent us, we set out with only a single black to carry the different specimens I might select in our way. That part of the island which we now traversed, though dry and arid, nevertheless presented many objects worthy of notice; and extremely different from those we had seen on the opposite side, or on the summits of the solitary mountains. But I had only time to glide over these treasures, and experienced much regret that I was thus forced to pass over many objects deserving a more minute investigation.

The road along which we travelled was very good, but the heat became in a short time almost insupportable; not a single tree was to be found to afford us a shelter. On leaving the bed of the river of *Saint-Etienne*, and ascending by a narrow path formed along its northern bank, we were suddenly met by a numerous flock of cattle which some negro boys conducted to water, and which had nearly frequently overturned both us and our horses.

These beeves are of a very large size; their horns are strong and considerably expanded; they have a protuberance between the shoulders, which often attains the bulk of a large melon, in which case it is moveable and rolls from side to side.

This animal seems to be a variety of the *Bos taurus*, L. They are imported from Madagascar, where they appear to be indigenous. Their flesh is affirmed to be extremely delicate. In the space of ten minutes we extricated ourselves from the herd of cattle; but before proceeding far a new accident, which

had nearly proved to be of a more serious nature, again disturbed our tranquillity.

The horses to be found in the African islands appear to have been brought from Arabia, but are become extremely degenerate; they are besides generally vicious, probably from being educated by the blacks, who are wholly incompetent for the task. It is an opinion very prevalent throughout these islands, that horses are rendered by castration wholly useless and unfit for labour. Hence it happens that persons riding on these animals are frequently brought into much jeopardy; for though possessing ever so little youth and vigour, as soon as they espy a mare it is scarcely possible to restrain and to prevent them violently attacking each other.

No sooner had we extricated ourselves from the herd of cattle than we perceived from a rising ground two mares, at the sight of which our horses began to neigh and caper, thus forewarning us of our danger. My horse in particular immediately became remarkably furious and ungovernable. Jouvancourt shouted to the black under whose care they were to put them into an adjoining inclosure till we should pass by. But the idiot, instead of executing this order, drove them to an open space, and left them to feed at large. Having now recovered their freedom, and being conscious of the neighbourhood of the stallions, they darted forward at full speed into the plain; at this moment one of the reins of my horse's bridle, by which I endeavoured to restrain him, gave way; upon which, finding himself at perfect liberty, he turned abruptly to the left, leaping over a ditch by the road side. Here then was I galloping at the risk every moment of breaking my neck among the rocks; it still appears to me a mystery how in this situation I kept my seat, and that both I and the animal were not killed.

The mares, which produced all the confusion, alternately approached and fled from us, as if to animate my horse still more by their tricks to throw his rider. As for Jouvancourt, he was scarcely more master of his horse than I was of mine; he was hurried along by his wicked steed, which being still more unmanageable than my own, took many dangerous leaps in order to dismount his rider. The black being fully sensible that all the mischief had arisen from his own stupidity, and foreseeing that if any misfortune should befall the animals entrusted to his care he would be unmercifully flogged by his master, set up such doleful cries as could not have failed to divert me had I not been altogether absorbed by a sense of my own danger.

These lamentations, our curses, and the incessant neighing of the animals, attracted from their huts a great number of the inhabitants; what irritated me most was, that not one of them seemed in

haste to afford us any succour. They remained tranquil spectators of our perilous situation, and appeared perfectly at their ease under the shade of their little dwellings. At last, after many turnings and windings made by my horse in order to join the mares, who seemed not ill disposed to receive him, he ran headlong towards one of these huts, against one of the corners of which he would have infallibly killed himself if a young man who viewed me attentively, and considered himself in danger, had not fortunately seized, at this critical juncture, the bits of my horse's bridle, and put a stop to his career. I immediately sprang from his back, and was rejoiced to observe that Jouvan-court had succeeded in settling himself firmly on his saddle, and was likewise out of all danger.

From being so much occupied with my own situation, I did not at first recollect having formerly seen the youth who came so opportunely to my assistance, either at the house of M. Dejean, or at that of M. Nerac. I confess that, far from acknowledging the assistance he had rendered me, I was about to express the disgust I felt at the conduct of himself and his neighbours, but was soon convinced of the impropriety of falling into a passion with these creoles. We therefore accepted from them some lemonade, sweetened with honey, and immediately pursued our journey.

On arriving at the ravine of *Aviron*, and following the great road, we left to the right several eminences furrowed by numerous torrents, clothed with vegetation, and on which a number of small habitations have been erected, that give to this place a very agreeable and picturesque appearance. At the base of these declivities the country is well cultivated, and in several places ornamented with beautiful plantations. It was not long till we came in sight of the magnificent mansion of *du Gaul*, which we had already observed from the summit of *Salazes*.

The *Chateau du Gaul* is situated between two branches of a river bearing the same name, and is constructed after the model of our country houses in France. It is built of hewn stone with a wing on each side, and a large court in front. M. Desforges, governor of Bourbon, caused it to be erected towards the middle of the last century. The heat was excessive; in a valley sheltered from the wind, the thermometer indicated $30\frac{1}{2}^{\circ}$. I was so oppressed by it as to be unable to descend a short way to measure the heat of the sand, which must have been extremely intense.

From the ravine of *Avirons* to that of *Saint Leu*, we travelled upon a dry road formed of fragments of stones, and intersected by several ravines. Some trees which grew here and there afforded a partial shade, of which the flocks took advan-

tage. I recognized among them the *Croton Mauritianum*, L. and the *Treminalia Benjoin*, L.

On arriving at *Saint-Leu* we no longer traversed a rocky coast, covered with spray, but proceeded along a naked shore composed of calcareous sand. This shore bounds a semi-circular bay, at the bottom of which is built the village; on entering which we immediately recognized the blacks that we had sent forward from *Saint-Pierre*. As the sand on the road was so extremely hot that it was impossible to walk over it without injury to the feet, these poor negroes had travelled in the sea-water, and afterwards along the damp shore for more than a league, until the road deviating from *l'Estran* presented a somewhat cooler surface.

As we ourselves were unknown to every inhabitant of *Saint-Leu*, and as we had been informed that they were much less hospitable than those in other parts of the island, we proposed to dine at a wretched inn, the only one I ever met with in the country, when chance conducted us before the house of a friend of Jouvancourt's, who recognized him and invited us to dinner.

The coffee of *Saint Leu* is reckoned superior to any other in the island, and it is here that individuals amass the greatest fortunes.

The road we were obliged to pursue in order to cross the two torrents, of which we have already spoken, was extremely fatiguing, and made several abrupt curves in the form of an S. The mount of *Panon* which commences at the termination of the great ravine was still more harassing; it stretches for about three quarters of a league, and joins the ravine of the *Trois-Bassins*. This mount is bordered by a small wood, composed of very fine trees and shrubs.

The coast from *Saint-Pierre* to *Saint-Paul* is bordered by calcareous reefs formed of the wrecks of marine animals. These reefs are a source of considerable emolument to the inhabitants who detach large portions from them which they burn into lime in furnaces constructed on the shore. The remains of several of these furnaces afford a very remarkable artificial stone well worthy the attention of Geologists.

The mounts, which we left to the right, rose insensibly towards the *Brûlé de Saint Paul*; their gentle declivities formed a vast amphitheatre of forests.

Towards the decline of day we reached the bank of *Bernica*, from which we beheld the sea at our feet. I soon espied the *Petite Fanny*, in which I was to take my passage to the Isle of France, moored in the road of *Saint-Paul*.

If we except *Saint-Denis*, *Saint-Paul* is the largest district in the island. It is embellished by many handsome houses and

numerous huts, as well as intersected by excellent roads in several different directions. The embankment on which we stood, together with the village, and the trees with which the roads are shaded, formed on the whole a most agreeable picture.

Bernica is the largest of the ravines which enter the bay of *Saint-Paul*: from its mouth we descended along a rampart to the house of M. de Lescouble, brother of Madame Lehoux, whom we found superintending the construction of an elegant new mansion. I felt considerable regret at not being able to accept his obliging invitation of remaining with him a few days, and afterwards accompanying him on an excursion to the river of Galets; but I readily agreed to his proposition of visiting *Saint-Paul* on the following morning.

We skirted the semicircular rampart towards the south, at the base of which the hospital is situated; not far from this place is a small basin, filled with water issuing from the bosom of the rocks in the form of cascades; a mysterious and humid grotto forms a subterranean prolongation of this basin, which is concealed from the eye by the over-hanging foliage, and through which the light of day never penetrates. This solitary and picturesque spot would form a very fine ground for a picture, on which might be represented Diana and her nymphs reposing themselves in a bath after the fatigues of a long chase.

After having visited this and some other grottos, we made the tour of the basin, near which several romantic situations attracted my attention, particularly one in the vicinity of Bernica, which forcibly recalled to my mind the scenes of Switzerland.

We left *Saint-Paul* on the 3d December, having the day before sent forward our blacks; on reaching the ravine of *Misfortune*, its name recalled to our mind the first crime which was committed in the island. It is related that a priest, and an inhabitant named *Marqués*, having quarrelled respecting the possession of a black, who each affirmed belonged to himself, the ecclesiastic, who was an extremely violent man, threw the slave into the torrent, saying to *Marqués* "Since I cannot have him, thou shalt not." *Marqués*, who was a hunter by profession, never went abroad without his musket. The priest, however, did not imagine he durst employ it against his person, which was reputed holy and sanctified by the ignorant creoles of that day; but indignant at the act of violence committed under his eyes, the intrepid hunter hesitated not to punish such a flagrant breach of humanity, and instantly shot the worthless priest dead on the spot. He immediately fled to the neighbouring solitudes, and lived a long time concealed towards the sources of the torrent; which still bears his name, and which we crossed at an early hour in the morning.

It was about three o'clock in the afternoon, at which time the heat became excessive, that we reached the signal post of *Saint Denis*; where three months before I had waited for Jouvancourt who had strayed from the path of the island of *Guillaume*. The grand descent from *Saint-Denis* terminated my fatiguing journey.

M. M. Capmartin, Lehoux, and almost all my companions dined this day at the house of M. de Montalent, where I hastened to join them. They hardly knew me, so much was I altered. My sun-burnt visage, large pantaloons, and blue shirt, gave me altogether the air of a creole: they were even tempted to take me for a maroon hunter.

I had only time to pack up my collections, and to pay some farewell visits in the course of the day and on the following morning. The *Petite Funny* having arrived from *Saint-Paul* on the same day as myself, and being to sail on the 4th in the evening, I took advantage of her departure to leave the island of Bourbon. We embarked about six o'clock, and I continued to gaze upon this interesting island as it receded from view until it was totally hid by the darkness of the night.

There had been little wind during the night, and at day-break we still continued before *Saint-Suzanne*. The weather was uncommonly fine, and we could still plainly distinguish the island; it afforded a truly grand and magnificent spectacle to behold these majestic rocks rising abruptly from the sea, and painted upon the azure sky.

We coasted the island as far as *Saint-Rose* in order to take on board a passenger. The wind being directly east, Captain Houareau continued to steer nearly south-east, with the view of taking advantage of the wind on the other tack. In a short time the clouds concealed from our view the picture we had been admiring, but at the same time they produced in the sky that mingled light and shade which is not less worthy of contemplation. At day-break on the following morning we perceived the Isle of France. Whilst we entertained a lively recollection of the grand prospects, and the lofty mountains of Bourbon, the eminences in the Isle of France dwindled on comparison to so many mole-hills, and indeed the whole country recalled to our mind the aspect of the plain of *Cafres*.

When we were within a league of the port, which Captain Houareau could not however enter on account of the wind being unfavourable, he had the complaisance to put us ashore in a boat, and in three days after the *Petite-Fanny* entered the harbour in safety.

Dreading that I would not be able to reach the north-west port in sufficient time to take advantage of the departure of the *Prince* for Europe, I left Bourbon with a precipitation which

my eager desire to revisit my native country could alone excuse. I was therefore extremely chagrined to learn, on my arrival at the Isle of France, that the *Prince* would not proceed on her voyage for two or three months. I was strongly tempted to employ this interval of leisure in making an excursion to the Sechelles. M. de Magallon, to whom I communicated my idea, advised me to renounce this enterprize, as they were then in such a particular situation as to render any communication with them improper.

The Sechelles are situated between the fourth and fifth degree of southern latitude, forming a very numerous archipelago. They are only rocks composed of a reddish granite, at the base of which are formed, by marine animals, calcareous depositions. They are generally low; some marine vegetables, and different species of palm-trees, among which the *Cocotier-geant*, whose fruit is improperly named *cocos des Maldives**, constitute their only verdure.

Having been obliged to renounce my intended project of visiting the Sechelles, I formed, in conjunction with Michaux, the design of proceeding to Madagascar, there to spend the time that must elapse before the departure of the *Prince*; but just as we were making the necessary preparations for our expedition, an English vessel arrived on the 30th December with the news of peace having been concluded between that country and France. This vessel had been dispatched from the Cape by Admiral Curtis. This intelligence prevented our leaving the north-west port, as we were assured that it would accelerate the sailing of the *Prince*.

During war, when our navy was unable to protect commerce, the lot of our oriental colonies was indeed truly deplorable; the commodities of the islands fell in value, while every article imported from Europe rose on the contrary to an exorbitant price. Sugar, coffee, cotton, indigo, and cloves had so much diminished in value that I have seen them employed as manure to prepare the soil for the reception of wheat and manioc. Some efforts ought certainly to be made with the view of improving the agriculture in our eastern colonies, and particularly in the Isle of France, where the inhabitants are much less industrious, and the ground worse cultivated than in Bourbon.

In this last island the right of succession is transmitted from father to son; hence they become attached to the soil where they first drew their breath, and experience both profit and pleasure in the cultivation of their paternal fields. Their feelings resemble what is termed *esprit de province*. In the Isle of France, on the contrary, the majority of the inhabitants are composed of

* *Lontarus. Jus.*



*Town & Harbour of St. Helena.
Feb. June 1805, by Richard Phillips, & Messrs. Bridges & Co.*

individuals from different countries allured hither by the thirst of gain, and whose thoughts are wholly occupied by commercial speculation; those individuals who either ruin themselves, or who realize great fortunes, with which they return to the mother country, generally dispose of the habitations they had purchased. This continual change of proprietors is unfavourable to agriculture, and wholly precludes those early associations of ideas which tend to produce and cherish the love of our country.

While waiting for the sailing of the Prince, M. Magallon, who wished to entrust me with a particular commission for the French government, secured me a passage on board a Hamburg vessel which had arrived a short time before, and was about to set sail in a few days. We had as passengers two deputies from the Colonial Assembly, charged, it was said, with an address to the government; it appeared however that this was not the real design of their mission; be that however as it may, they were extremely gay and very agreeable, they greatly contributed to enliven us during the passage, and I esteemed myself happy in having such agreeable companions.

Having made the necessary preparations for my departure about the beginning of March, I spent a few days in taking leave of those persons who had heaped upon me so many civilities during my residence among them. Michaux, Dumont, Deslissee, as well as all the other individuals of the expedition, testified the most lively regret at our separation, which perhaps might be for ever. I particularly experienced much emotion on bidding farewell to Michaux; I know not how to account for it, but I felt a presentiment that it would be for the last time.

I passed the morning of the 16th March at the residence of the governor, in order to receive my final instructions. Loaded with his favours, and flattering myself with being able to evince my gratitude by the manner in which I should fulfil his wishes, I bade him adieu at 5 o'clock in the afternoon in order to repair on board.

CHAP. XXII.

RETURN TO EUROPE.—VISIT TO SAINT-HELENA.

16th March, 1803.

THERE being little or no wind during the night, we were still in sight of the Isle of France at day-break; at noon it wholly disappeared from our view. We pursued our voyage in safety, and without the occurrence of any material circumstance until the 30th of April, on which day we descried Saint-Helena. This island is extremely well fortified; while I was

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remarking the number and extent of the batteries we entered the road. On landing we enquired for the residence of the governor, whom we intended immediately to visit. On arriving at his house we learned he had just sat down to table, I therefore proposed to the other passengers that we should depart and again return at a more convenient opportunity; but while I yet spoke an aid-du-camp joined us: in a few minutes afterwards the governor himself appeared. He received us with great civility, and with a gravity which was so much the more remarkable, as it was evidently assumed for the occasion. He was a man of about sixty years of age, thin and ruddy, with a full bottomed wig highly powdered, and curled like that of Quipotis, which gave him a very comical air. He addressed to us several sentences, which were doubtless very polite; and he prevailed on us to go up stairs and partake of the repast. As I did not fully understand what he said, his aid-du-camp told me in a jargon hardly intelligible that the governor had *been speaking French to me*.

At a moment when France had just compelled Europe to grant her a glorious peace, but had yet scarcely breathed from those revolutionary commotions which had tarnished her reputation in the eyes of her enemies, I knew not well what behaviour to assume among men who must have been prejudiced against us. I was desirous to appear neither humble nor haughty; and yet to maintain a character among those who believe they possess one themselves, and who judge of every thing by appearances. Though I suspected that my acceptance of the governor's obliging invitation might be unseasonable, I was nevertheless curious to see the English at one of their great dinners. My companions freed me from this dilemma. They ascended and I followed.

The dining room was large, simple, scantily furnished, but with good taste. In the middle of the apartment was placed a table containing forty covers: all the company rose on our entrance, and remained standing until we were seated. I remarked that they placed one or two English between each of us; almost the whole of the guests were military officers. I had previously dined, consequently could not partake of the repast.

Two ladies, daughters of the governor, sat with us at table, and I understood he had two others, who were then in the country. These ladies appeared to great advantage in my eyes, as it was a long time since I had seen a beautiful female. One of them appeared to be about twenty: her fine black hair fastened up with a tortoise-shell comb formed a striking contrast with the delicacy of her complexion, and the elegant simplicity of her attire. The other, who might be about two years

older, wore a black velvet riding hat, trimmed with crimson and ornamented with a plume of black feathers. Their manners were extremely gracious, although not in the least similar to those of the French ladies.

On dinner being finished the cloth was immediately withdrawn, and a desert served up. It is the custom for the ladies to retire to the drawing-room, where they remain till tea-time, while the gentlemen give themselves up to the pleasure of the bottle.

I knew not whether to mourn or rejoice at the departure of the ladies; scarcely had I had time to regard them, but my companions seemed to be very much at their ease, and I was willing to enjoy a specimen of English conviviality.

Two hundred crystal bottles filled with madeira, port, and claret, were placed upon the table with the desert. The claret wine, which the English imagine to be excellent Bourdeaux, although really brought from that city, is only a mixture of white and red, which is reckoned extremely unwholesome, and which our best judges of wine will not taste.

I scarcely know how I preserved my senses through this memorable day, for notwithstanding the number of toasts I avoided, I was compelled to drink a prodigious quantity of wine. I longed for the conclusion of the desert, in order to avoid intoxication, which would have prevented me from again presenting myself before the governor's daughters. About eight o'clock every one arose from table, and several of the guests joined the ladies in the drawing room.

As it was whispered at table that I belonged to General Magallon's staff, two tall gentlemen approached me, and one of them, a colonel of engineers, who spoke French tolerably well, began to converse with me. He made a multitude of inquiries concerning the Isles of France and Bourbon, their resources, their population, and the means of their defence. I was almost tempted to treat him in the *English style*, by exaggerating on every topic of his enquiries. I forbore, however, and returned such answers as I thought proper and conformable to truth. The other gentleman, who had been silent for an hour, then took his turn of the conversation; and after having again interrogated me, took an opportunity of saying that he was Commodore Elphinston.

This gentleman enjoys a certain degree of reputation in the English navy, and had served it seems with distinction in India. On receiving accounts of the peace, he had left his ship, and taken his passage for England on board an Indiaman. The commodore had frequently cruized before the Isle of France. He had a high opinion of the talents of General Magallon; and he

informed me that had not the peace taken place, his government had projected an attack on the Isle of France. He besides added that he was to have directed the execution of it. As he descanted to me on all the formidable resources which would have been employed, I told him with politeness, that had the attack taken place, I should have rejoiced if it had been conducted by him, because his good offices to the prisoners whom he had frequently taken had secured him the affection of many people. The commodore misunderstanding the import of my words, thanked me heartily; and after having frequently repeated *you are too polite*, he added, *indeed after the reduction of the island, I should have done all in my power to have secured good treatment to every one.* Here I interrupted him. "Commodore," said I, "you have misunderstood me; my only reasons for wishing you to attack us in preference to another is, that the governor might have had it in his power to return to you, when a prisoner, all the civilities which you have shown to the seamen whom you have taken on different occasions." On this the conversation broke off. My two Englishmen turned their backs on me, and have never seen me since.

While the colonel of engineers interrogated me respecting the state of our islands, I put a great many questions to him in my turn in regard to *Saint Helena*. He doubtless believed me not only blind, but altogether ignorant of geography, since he described the island not only as very extensive, but extremely fertile. Its interior, according to him, was a perfect paradise, and infinitely more valuable than the Cape; nothing, said he, is comparable to the resources which it affords to English vessels going and returning between India and Europe. The garrison, he added, amounted to more than fifteen hundred men, and the population to about ten thousand.

Commodore. Elphinston was less enthusiastic in his phrases of this island, through which he had made an excursion. He even informed me he had observed in its interior two craters belonging to an extinguished volcano; that several of the districts were wholly destitute of vegetation; and that he was anxious to depart.

Notwithstanding the affirmation of the colonel of engineers, it appears that *St. Helena* is not more than two leagues in its greatest diameter, and that the garrison, when I touched at the island, did not exceed eight hundred men. I could not form a competent judgment of the amount of its population, but from a variety of circumstances I am inclined to believe it does not surpass three or four thousand souls. I recollect to have read somewhere that it amounted to seven thousand, but I should suppose even that calculation too high.

In the drawing room stood a piano-forte, on which lay some music books. The governor inquired if I sung, at the same time informing me his daughters were thought to be considerable proficient in music: they had such beautiful mouths and eyes that I did not find it difficult to give implicit credit to his assertion. I entreated them to favour me with a specimen of their powers; to which they consented, on condition that I would sing also, a request it was impossible to refuse. One of the young ladies sung extremely well although somewhat in the old style; her voice was at once mild and languishing.

As it was late when we left the government house, and as I had not previously engaged apartments ashore, I returned to sleep aboard, with the intention of exploring the island on the following day.

I was consequently much disappointed on learning that no stranger whatever was permitted to visit the interior of the country, or enter any of the forts, so that it was impossible for me to form any adequate idea of its means of defence. Reduced to wander about the environs of the city, and explore the ravine on which it is built, the heat appeared to me excessive. The only vegetables which grew upon the left bank, which I first visited, were the *Salsola fruticosa*. *L. Panicum verticillatum*. *L. and Portulaca oleracea*. *L.*

With respect to the volcanic productions, they were sufficiently various; and I was so much the more chagrined at not being permitted to examine the craters, as several specimens of the lava similar to those I had seen in the Canaries differed exceedingly from those of the isles of France and Bourbon.

The soil is exceedingly barren; and if we except perhaps about ten species, all the vegetables we observed in the country were exotics, and the number of these which they have succeeded in naturalizing are still extremely small.

There is a garden belonging to the company situated opposite the church, which is employed as a kind of nursery for the plants imported into the island, and where the soil has been somewhat meliorated by means of cultivation and the importation of vegetable earth.

I likewise visited another garden belonging to the governor at the extremity of the city, but here vegetation was much less luxuriant than in the former.

It should seem that bulbous and tuberous rooted plants succeed very well on those parts of the island which are in the least degree susceptible of cultivation, as we purchased some excellent potatoes, as well as a few leguminous vegetables of a sufficiently good quality, but at an extravagant price.

Not being permitted to go beyond the precincts of the city, I

was affected with an uncommon depression of spirits. I believe in fact that if I had been thus confined fifteen days in a country, the interior of which I had figured to myself as being extremely interesting to the Geologist, I would seriously have fallen sick. Every occupation became irksome to me, my imagination dwelt continually upon the country, and I longed to depart from the species of prison in which I was confined.

During my stay at Saint-Helena the weather was extremely delightful. I was at first surprised that the heat was not greater in the city, the houses of which are of a dazzling whiteness; but I immediately perceived that the disposition of the valley on which it is built, by producing a constant current of air, tended greatly to moderate its temperature. I was assured that during the winter the cold is excessive in the interior of the country; besides at that season the rains are heavy and frequent, if we may judge by the furrows which the waters have produced in several places.

The captain having informed me that he intended to depart on the 25th, I went aboard at noon, accompanied by some English officers with whom I had become acquainted during my short abode in the city. These officers had served in India during the war. They had formed the most extraordinary and absurd ideas respecting our revolution. They even appeared surprised to discover any thing like a human figure under a national uniform; in a short time however they became much attached to me.

At half after six we weighed anchor, and with a fair wind from the south quickly lost sight of the island. We continued our course without any accident, and on the 16th May crossed the line in $25^{\circ} 36'$ west of Paris. The day was uncommonly fine and the heat tempered by a fresh breeze. Every one seemed to experience a pleasurable sensation in the hope of speedily revisiting his native country, when an occurrence of a disagreeable nature gave a sudden check to our hilarity.

The surgeon was a tall young man, about twenty-eight years of age, mild and obliging in his manners, but somewhat taciturn. I know not on what account, but he was extremely ill-liked by the crew. The sailors taking advantage of the passage of the line in order to play him a mischievous trick, presented the usual petition from Neptune and his spouse. We were permitted to commute the ceremony of baptism, but the poor surgeon was not suffered to get off so easily.

After tying his hands behind his back, they seated him above a bucket of water into which they plunged him several times, and after continuing this and several similar indignities for near an hour, they bedaubed his face and part of his body with the

colours they employ to re-paint the vessel on reaching the road. As this farce was pushed to an indecent length, we were obliged to employ our intercession with the captain in order that he might put an end to it. After effecting the deliverance of the surgeon, we intermixed with the crew, and took a share in their sports. Each of us provided with a bucket, threw water on one another. While we were diverting ourselves in this noisy manner, the sailor at the helm suddenly cried out, *the doctor is in the sea.*

At these words our sports ceased; the captain ordered the vessel to be put about, and crowding upon the poop, we discovered the unfortunate surgeon swimming against the waves.

In order to avoid any farther persecution, and to free himself at his leisure from the paint with which he was besmeared, this unfortunate young man had taken the resolution of holding by the extremity of a rope, and letting himself gently descend into the sea, where he intended to remain a quarter of an hour in tow. As we were then sailing at the rate of seven knots, he found it impossible to resist the violent shocks produced by the ship's motion, and had only time to cry, *I shall be drowned*, on quitting hold of the rope. Happily for him this exclamation was heard by the steersman.

Before the ship could be put about and the boat lowered, ten or twelve minutes had at least elapsed, and we were full a quarter of a league a head of the unfortunate sufferer. Not being any longer able to distinguish the vessel, and overcome by a sense of his dangerous situation, he imagined himself abandoned by us, and ceasing any farther to struggle with his fate, he was in the act of sinking when the sailors in the boat seized him by the hair. When brought on board he was wholly unconscious, cold, rigid, and of a purple colour; violent reaching, accompanied with hiccup, were the only indications he gave of life.

The French passengers took the most lively interest in the fate of this unhappy young man, while his companions on the contrary betrayed not the smallest uneasiness on his account. On expressing to the captain my astonishment at the indifference he displayed on this occasion, he replied to me with the greatest insensibility, in a jargon somewhat resembling French: *I have saved him, he may cure himself.* This reply well depicts the character of the northern nations; but a circumstance occurred on this occasion which still better displays the characteristic features of the Hamburgh traders, who to the phlegm produced by their climate join all the parsimony of men whose ideas are wholly directed towards the profit to be derived from mercantile speculations.

At the moment of the steersman's exclamation, I stood near a

hen-coop containing five or six chickens, which I immediately threw overboard: it fell at not more than ten fathoms from the surgeon, and if he had not by that time partly been deprived of his recollection he might easily have seized it, and remained in comparative safety until more effectual succour could have been afforded him. The supercargo, who was a young man of about twenty-eight, observing the action, approached me as if nothing had happened, and said with the greatest coolness, "Because the doctor chuses to drown himself, is that any reason why you should drown the chickens? You should have taken them out before throwing away the coop. By your means we shall have no more poultry for dinner."

Two or three days elapsed before the health of the surgeon was re-established; unfortunately, however, he continued in a somewhat deranged state during the remainder of the voyage. In the night he was disturbed by the most disagreeable visions, and I much question if he will ever perfectly recover the use of his reason.

We arrived without farther accident on the coast of France on the 10th July; and the hope of soon once more beholding my native country made me forget the length of our voyage. At noon on the 11th we descried the magnificent light-house of Cordouan; elevated 300 feet above the level of the sea; it appeared to us only like a small spear. The fire which serves as a signal to vessels out at sea is seen at the distance of nine leagues.

Individuals attached to their country, and who have been long absent, can only form an idea of the rapturous pleasure I enjoyed on once more respiring my native air. On entering the Gironde, I renewed my acquaintance with those places on the coast where I first began to make researches in natural history, and acquired a taste for travelling.

The nature of the mission with which I was charged by General Magallon not admitting of delay, obliged me immediately on landing to set out for Paris. I could not even remain at Bordeaux to meet my relations, whom I had not seen since my departure for the army. This was the only disappointment with which my happiness was allayed on revisiting my native land.

THE END.

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